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Paper TRADE JOURNAL

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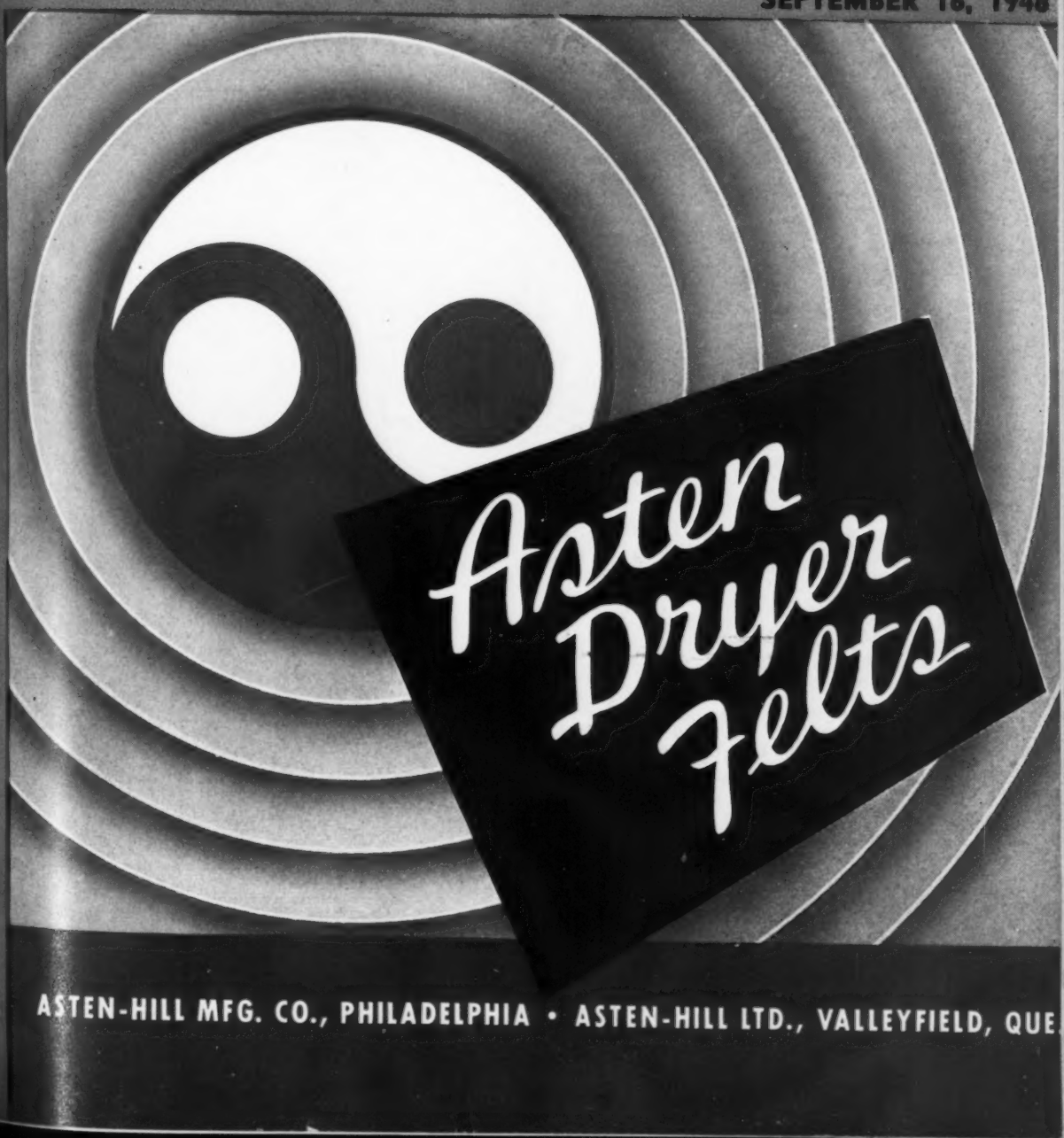
VOLUME 127, No. 12

SEPTEMBER 16, 1948



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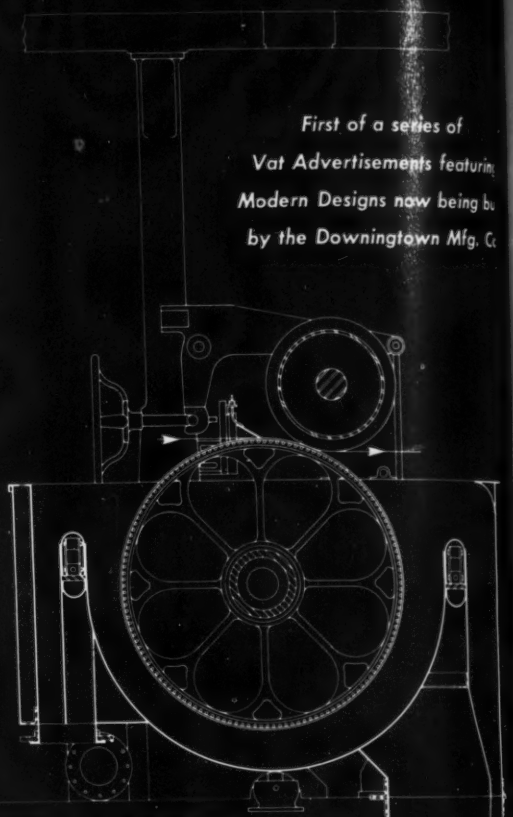

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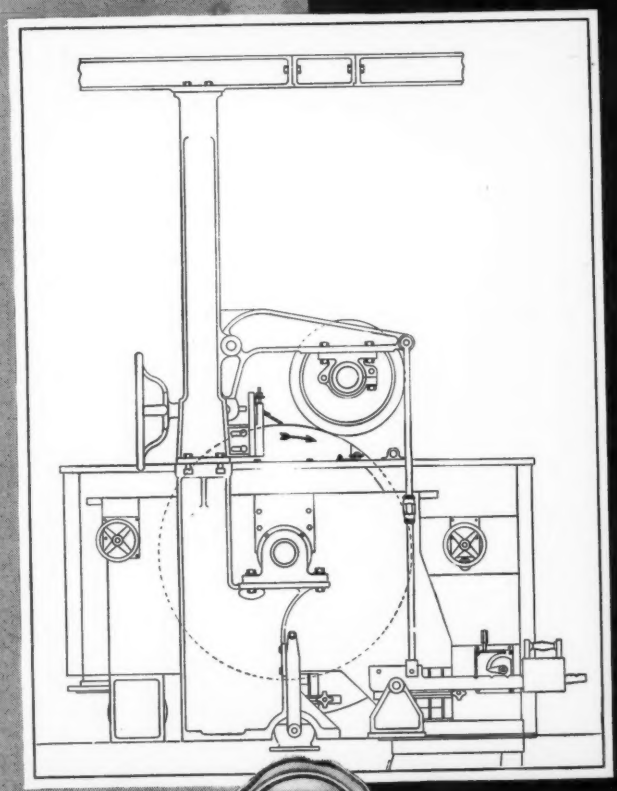

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DOWNINGTOWN
Designers & Builders
Paper Making Machinery

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CALENDAR OF COMING EVENTS

ASSOCIATION EXECUTIVES: Please send us your meeting dates and locations for this column as far in advance as possible. No charge for publication.

SEPTEMBER 17: Northeastern Wood Utilization Council. Boston, Mass.

SEPTEMBER 23-25: Northeastern Division Meeting, American Pulp & Paper Mill Superintendents Ass'n. Poland Springs House, Poland Springs, Maine.

SEPTEMBER 27-29: TAPPI Mechanical Pulping Conference (Joint meeting with CPPA Technical Section.) Poland Springs House, Poland Springs, Maine.

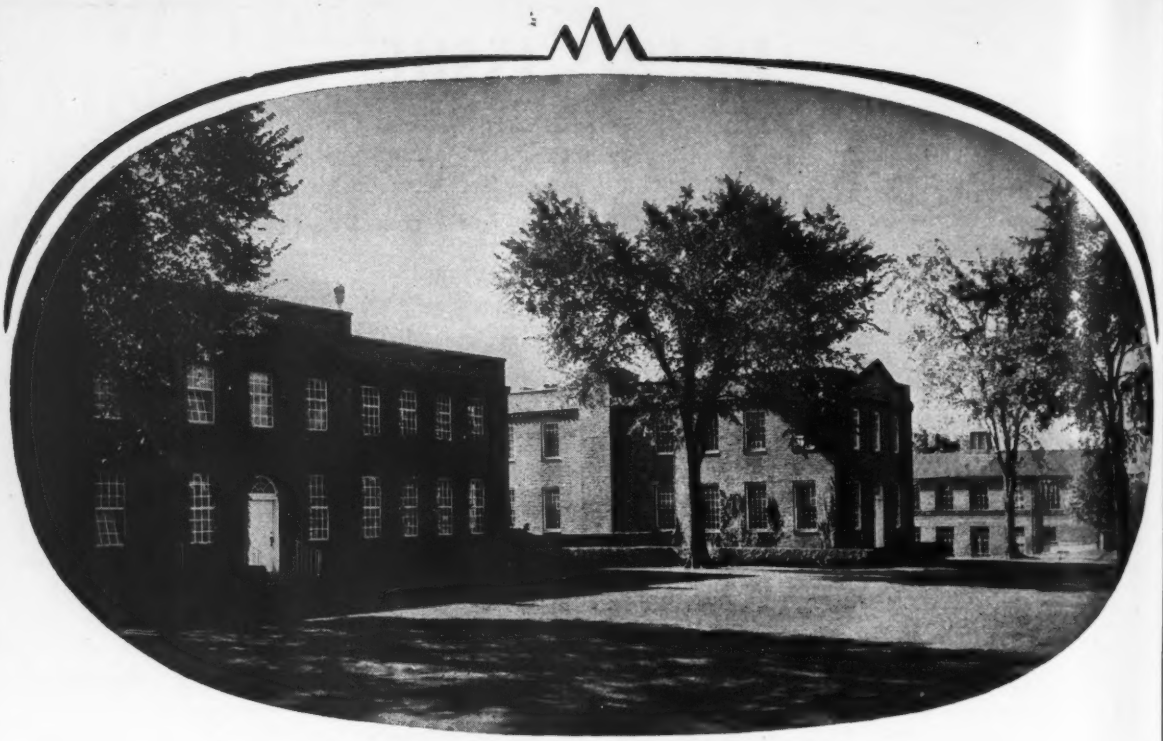
OCTOBER 11-14: TAPPI Testing Methods Conference at Mellon Institute, Pittsburgh, Pa. Headquarters, William Penn Hotel.

OCTOBER 12-16: Fifth National Chemical Exposition. Coliseum, Chicago, Ill. For details, write to Marcus W. Hinson, manager, care of Chicago Section, American Chemical Society, 1505 South Wabash avenue, Chicago 5.

OCTOBER 21-23: Joint Meeting, Southern and Southeastern Superintendents Divisions. Biltmore Hotel, Atlanta, Ga.

OCTOBER 25-28: Third Engineering Conference of the Pulp and Paper Industry sponsored by TAPPI. Statler Hotel and Westinghouse Electric Co., Auditorium, Buffalo, N. Y.

OCTOBER 28-30: National Paper Trade Ass'n., Fall Convention. Stevens Hotel, Chicago, Ill. For details write to Arthur H. Chamberlain, 220 East Forty-Second Street, New York 17, N. Y.



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Paper TRADE JOURNAL

VOL. 127, NO. 12 REG. U.S. PAT. OFF. SEPTEMBER 16, 1948

2,500 See Logging Equipment Show

COOPERSTOWN, N. Y.—More than 2,500 visitors attended the demonstration of logging equipment held at the Mike Kalan woodlot near this city on September 8. More than half a million dollar's worth of equipment was shown by approximately 30 manufacturers and local distributors.

The show was sponsored by the Northeastern Forest Experiment Station in conjunction with the N.Y. Section of the Society of American Foresters. The latter organization held its summer meeting at the Ote-sa-ga Hotel, September 9-10.

The demonstration was repeated on September 9 for the benefit of the section members who were unable to attend the previous day's showing.

Most of the arrangements for the show were handled by Fred Simmons forester and logging specialist of the Northeastern Forest Experiment Station, with the assistance of some of his colleagues and some of the members of the program committee of the New York section of the Society of American Foresters. Allen Bratton of Cooperstown was chairman of this program committee and Tom Luther is chairman of the Section.

A prevue of the demonstration was televised over station WGY-TV, Schenectady, N. Y., at 7:30 P. M. September 7. Descriptions of the demonstrations were broadcast by means of a portable transmitter, over the Rural Radio Network.

A complete story, with pictures of the equipment shown, will be published in an early issue of *Paper Trade Journal.*

Crown Zellerbach Lauded

WASHINGTON—The National Planning Ass'n., on September 13 urged that for a change the U. S. public look at labor-management harmony as it released an analysis of a history of 14 years of constructive industrial relations in the Crown Zellerbach Corp. and the Pacific Coast pulp and paper industry. This analysis is the first in NPA's three-year project on the causes of industrial peace.

Both businessmen and labor leaders plagued by industrial warfare can profit from the practical experience of companies and unions who have achieved constructive industrial peace, the Association asserted. Though such experience offers no single cure-all for industrial conflict, one factor present in thousands of unpublicized cases is an active striving for peace by employers who believe in the principles and actual practice of true collective bargaining and by unions who accept private ownership and operation of industry, it was pointed out.

These conclusions are highlighted in a unanimous Committee statement released by Clinton S. Golden, chairman of the NPA Committee on the Causes of Industrial Peace Under Collective Bargaining. The statement accompanies the Crown Zellerbach report, the first in a series of separate studies of 15 companies and unions who have had peaceful relations.

The positive approach to peace by management and labor in the Crown Zellerbach Corp. and the Pacific Coast pulp and paper industry is analyzed in the first *Case Study* by Dr. Clark Kerr, a member of the NPA Committee and Director of the Institute of Industrial Relations, University of California at Berkeley, and his associate, Roger Randall.

Crown Zellerbach is the largest company in this west coast industry, but its management-labor relations must be evaluated in the light of the region-wide bargaining mechanism of which it is a part, it was emphasized. Two AF of L unions—the International Brotherhood of Pulp, Sulphite & Paper Mill Workers and the International Brotherhood of Paper Makers—have dealt with Crown Zellerbach and the Pacific Coast Ass'n., of Pulp & Paper Manufacturers since 1934 without a single work stoppage because of a dispute between a mill and its employes.

The Committee stresses, however, that it was not only the lack of strikes which made "virtually inescapable" the selection of Crown Zellerbach and its West Coast industry for study. The on-the-spot investigations of the authors show that a high quality of peace has existed.

Many Crown Zellerbach policies and procedures described by the authors, the Committee believes, could be applied profitably to management-labor relations in other industries. Among Crown Zellerbach procedures which receive attention in the report are:

The Company's practice of consulting foremen and union representatives on an almost unlimited range of problems; and of inviting union participation in management on a consultative basis.

Its use of the line organization of management and the union hierarchy as effective channels of upward and downward communication with the foremen and shop stewards as key individuals.

Its projection downward and wide diffusion of management responsibility.

The ratio of foremen to workers has been high, and they have been fairly treated and given considerable authority.

The strengthening of the sense of security of the individual workers by promotions largely in line with seniority, by a liberal retirement system, and by advance consultation with them in preparation for technological changes.

Its selection of employees partly on the basis of their ability to fit into the human relations system of the plant.

Its avoidance of paternalism.

Its avoidance of pat formulas and rigid rules in favor of a flexible approach to problems.

The bargaining on a high level, with the principals on both sides participating and with lawyers barred.

The administration of the contract through an effective grievance machinery.

A number of favorable factors have entered into the relationship at Crown Zellerbach—a homogeneous work force, interesting jobs, regular employment in an expanding and profitable industry. But the essential element of the success was the social skill of the parties to the bargaining—their willingness to work out a mutually acceptable sharing of power and rights and their attempts to preserve the maximum amount of freedom for the individual within an ordered industrial society, it is stated.

While the situation at Crown Zeller-

(Continued on page 11)

Receiving Tree Farm certificates at the recent Forestry "Look-See" meeting held in the Bigwoods Experimental Forest near Franklin, Va., are (left to right): J. H. Johnson for Ellis Olsson, 999 acres; Clinton L. Williams, 1,725 acres; J. M. Camp for Camp Mfg., Co., Inc., 129,000 acres; A. W. Showalter, 20 acres; Rudolph Wachmann, 1,550 acres; and L. L. Thorpe, 356 acres.

60-Year-Old Forest Operation

WASHINGTON—The recent dedication of a 129,000-acre tree farm, owned by the Camp Mfg. Co., of Franklin, Va., focuses attention on a forest operation which has been doing business at the same old stand for 60 years, the American Forest Products Industries, Inc., stated on August 31.

"In a day when migration was the rule among many forest industries, Camp migrated just once," an Association spokesman recounted. "In 1887, it moved its sawmill from North Carolina a short distance into Virginia. Not only has the company prospered by staying put, but its expansion has been notable. Today, it produces some 30 million board feet of lumber a year, consumes 150,000 cords of pulpwood in its pulpmill, and operates a retail lumber yard.

"The company's expressed purpose of staying in Franklin another 60 years—or indefinitely — is now being firmly founded on a forestry program geared to the growth of the soil in its area. Its new "Tree Farm" is evidence of this policy. When the company first moved to Franklin, it owned no land. Today it has 230,000 acres; 54,000 in North Carolina, 130,000 in Virginia and 33,000 in South Carolina. It leases 20,000 acres more in North Carolina and Virginia.

"Its forest poliices have grown out of experience, plus sound technical direction. It was back in 1927—in a day when southern forest growth had made little industrial impact—that they decided to manage their tree-land for continuous production. William L. Hall became their first consulting forester, and much of his planning is in practice today. Among other things, he developed a diameter cutting system which is still followed on some tracts. T. N. Barron now heads the forestry department.

"Vexing to Camp, as to many other forest operators in the South, are the inroads made by hardwods which have been replacing pine on cutover areas. To further studies of this problem, the company has made 1,352 acres available to the U. S. Forest Service as an experimental plot. Controlled burning, poison, various cutting methods are under study. Included also is work on soils and other factors influencing growth. Results are expected to be helpful, not only to Camp, but to other operators in the coastal plains.

"In addition to the protection given by the Virginia Forest Service, the company has plowed fire lines through and around its tree farm. In all, the company maintains approximately 1,000 miles of fire lines with its equipment. Since 1940, all timber cut on its lands has been marked by foresters, following various cutting practices, such as seed, strip and tree selection methods.

"The company estimates that about 30 percent of its sawlogs and pulpwood comes from its own land. Its sawtimber growth today has been computed at 150 to 175 board feet per acre each year, and its pulpwood growth at about one-third cord per acre.

"Since 1938, the company has planted 1,055 acres in North Carolina and 817 in Virginia. Plantings of 1,000 loblolly seedlings to the acre have shown an 85 to 90 percent survival. Some slash and longleaf plantings have been undertaken for experimental purposes. In seed tree cutting, the general practice has been to leave 10 to 12 such trees per acre. On some leased land, it is interesting to note that the seed trees remain the company's property, to assure that they will remain until the areas are satisfactorily restocked.

"Not only in the forest, but in the mill, the company has attacked industrial problems. About two years ago, it installed a Swedish-type long log barker in connection with its sawmill. The clean slabs and edgings diverted to the pulpmill have been equivalent to about 15,000 cords of pulpwood annually. This, according to the company's records, is equal to the annual growth of about 45,000 acres."

Three brothers—P.D., R.J., and J.L. Camp—founded the company. Their descendants direct its operations today. J. L. Camp, Jr., is president. H. D. Camp manages the paper division and W. M. Camp the lumber division. J. M. Camp is manager of timber, logging and wood procurement.

The dedication of the 129,000-acre Camp tree farm has brought the newly organized Virginia "Tree Farm" system to a total of 186,183 acres. It is sponsored by Virginia Forests, Inc. Cooperating agencies include the Virginia Forest Service, the Extension Service of the Virginia Polytechnic Institute and the Soil Conservation Service. The Southern Pine Association has given direct assistance. National coordinator of the American Tree Farm System is the American Forest Products Industries, Inc., Washington, D. C.

To Feature "Short Course"

CHICAGO — The third annual Industrial Packaging and Materials Handling exposition, to be held at Hotel Sherman, October 5-7, will feature among other attractions, a packaging and materials handling "short course" jointly conducted by the University of Illinois extension division and the Industrial Packaging Engineers Ass'n.

Mid-Summer Meeting Technical Section, Canadian Pulp & Paper Ass'n.

VANCOUVER, B. C.—Program of the well attended Summer Meeting of the technical section of the Canadian Pulp & Paper Ass'n., September 8-9, included presentation of the following papers:

"Wood Waste as a Source of Pulp on the Pacific Coast," by F. W. Guernsey, chief, division of wood utilization, Forest Products Laboratory, Vancouver; "Magnesia Base Sulphite Pulping," by R. S. Hatch, research director, Weyerhaeuser Timber Co.; "Silo-Type Chip Storage of British Columbia Pulp & Paper Co., Ltd.," by J. Guthrie, superintendent (wood fibre), and R. H. Richmond, control superintendent (Port Alice) British Columbia Pulp & Paper Co., Ltd.; and "Multistage Bleaching of Kraft Pulp," by Dr. Joseph L. McCarthy, University of Washington, and Dr. Harold Hibbert.

"Operation of Horizontal Bar Chipper," by W. W. Brown, technical supervisor, Sorg Pulp Co., Ltd.; "An Approach to Vibration Problems on the Paper Machine Fourdrinier," by H. B. Urquhart, assistant to resident manager, and F. H. Ruley, paper mill superintendent, Powell River Co., Ltd.; "Flocculation of Cellulose Fiber Suspensions," by Dr. G. S. Mason, research associate, Pulp & Paper Research Institute of Canada, and "Instrumentation in a Modern Kraft Mill," by F. H. Ludwig of Bloedel, Stewart & Welch, Ltd.; "Deflection Tests — Suction and Top Rolls," by E. T. Buchanan, assistant chief engineer, Consolidated Paper Corp., Ltd.

"An Informal Resume of Recent Improvements in the Operation of the Westminster Paper Co., Ltd.," was led by John Ashby, mill manager.

Visits were made to the mills of Canadian Boxes, Ltd. (subsidiary of Pacific Mills, Ltd.; Pacific Mills converting plant, and New Westminster Paper Co., Ltd.

Dinners, luncheons, sightseeing tours, golf and other entertainment were other features.

Drouth Lowers Wisconsin River

WISCONSIN RAPIDS, Wis.—A gloomy picture of the hydro-electric situation in the Wisconsin river valley and elsewhere in Wisconsin was given at a meeting of industrial power superintendents in Wausau on August 23, according to E. E. Belter, of this city, who represented the Consolidated Water Power & Paper Co. at the meeting.

Also in attendance were E. P. Gleason and Frank Coldwell, Port Edwards, representing the Nekoosa-Edwards Paper Co.

With operations already curtailed at a number of paper mills in the valley as a result of the power shortage, the Wausau conference was held to consider the advisability of further restrictions on industrial power consumption.

Belter declared that Wisconsin River reservoirs were at their lowest levels in history.

Consolidated, unable to generate sufficient power at its own hydro plants, has been purchasing current from outside sources, but is still short of its requirements. As a consequence, paper production at the company's Wisconsin Rapids, Biron and Wisconsin River divisions has been reduced by about one-quarter of normal output.

500 At Medinah Meeting

CHICAGO — Five hundred men attended the annual golf tournament of the Chicago Paper Ass'n. at the Medinah Country Club, on August 31. More than 260 of the mill men and suppliers used two of the club's three courses.

Winner on the No. 1 course was "Sonny" Rosenberg with a tie on the second course between J. O'Connor and H. Bell.

Proceeds of the outings will be divided between the Institute of Paper Chemistry and two charities, according to J. S. Druth of the Chippewa Paper Products Co., chairman of the golf committee.

The dinner, served in the clubhouse dining room, was followed by a show in the ballroom. Concluding feature of a crowded day of pleasure was the awarding of prizes, with each guest receiving a gift.

Job Problem Discussions

MADISON, Wis.—Warren W. Whitlinger, superintendent of production standards, and Norman E. Jensen of the personnel department of the Kimberly-Clark Corp., Neenah, Wis., will serve as discussion leaders of a "Knowing Jobs" session of the Industrial Management Institute at the University of Wisconsin, on September 22. Mr. Whitlinger will also serve as leader of an afternoon session on "Workers On Jobs" the afternoon of the same day.

The institute on "Human Relations For Plant Superintendents" is being held September 20-24.

Merchant Sales Up Nationally

WASHINGTON — Wholesale firms in the South Atlantic States (Delaware, District of Columbia, Maryland, Virginia, and southward) registered the only gains reported by the Bureau of Census in its September 7 national survey, covering paper and products. A panel of wholesalers representing these states showed a two percent improvement in the first seven months this year over the same months of 1947. July sales of seven firms in the region, however, were off four percent from a year earlier, and down seven percent from June.

For the country as a whole, a panel of 62 firms reported July sales of $7,265,000, off 12 percent from June, and down seven percent compared with July, 1947, although the first seven months this year saw no change from the corresponding 1947 period.

For the New York, New Jersey and Pennsylvania area, some 20 firms had sales totaling $1,882,000 in July, five percent below those in July 1947, and 13 percent below June sales. For the first seven months of the year, their sales showed a drop of four percent.

Rate Hearing Postponed

BOSTON—New England paper manufacturers have been informed that the Interstate Commerce Commission, on September 8, approved a petition for suspension of proposed increases in motor carrier rates to Boston from 21 New Hampshire cities and towns. The rate boost, ranging from 11 to 22 percent, had been applied for by the New England Motor Rate Bureau, Inc., and would have become effective on the date on which the suspension was approved. The ICC ordered that the new schedule be deferred unless or until otherwise directed by the commission, with no changes to be made in current rates, charges, regulations, or practices during the period of suspension.

Set-Up Paper Box Meeting

CHICAGO—The Set-Up Paper Box Ass'n., will hold its first meeting of the 1948-49 season, the evening of September 23 at the St. Clair Hotel. National Secretary William Kreeger will be present. The discussion period, following the dinner, will be given over to wage rates and general economic conditions of the industry.

Meetings are scheduled for the third Thursday of each month during the season.

Walsh Cleveland President

CLEVELAND — John H. Walsh has succeeded the late Albert H. Seyler as president of the Cleveland Paper Co., and Orlin W. Herthneck has been elected vice-president in charge of sales.

Zellerbach Employes' Outing

SALT LAKE CITY—Employes of the Zellerbach Paper Co., and their families, held an outing at Lagoon on September 4.

How Users Appraise the Paper Markets

Report released Sept. 8 by the Paper Committee of the National Ass'n. of Purchasing Agents, under the supervision of Chairman T. A. Corcoran, Courier-Journal and Louisville Times Co., Louisville, Ky.

Odd things are happening in the paper market. Rag papers, which some months ago were reported quite easy, are scheduled for price increases. Pulp, which at about the same time was very scarce, is reported now as in good supply, with the exception of a few grades; and possibilities of lower prices, particularly on foreign pulp, are considered good.

The production ratio for all paper and paperboard in the U. S. continues to decline. In March and April, production was 100.8 percent of rated capacity. This figure dropped to 100.4 percent in May, to 94.5 percent in June, and to 88.1 percent in July. This seems to indicate quite clearly that the overall paper supply has overtaken demand; otherwise full capacity would be used.

Fine Papers

By E. E. McCULLEY
Courier-Journal Job Printing Co.
Louisville, Ky.

The rag grades of fine paper have been in the process of being increased in price. The raise, so far, is not universal, and some speculation as to whether it will stick is not out of order. In fact, a little shopping around with important tonnage will find receptive audiences with varying views as to what paper is worth.

Some unusual things are going on in the field of printing papers of all grades that eventually affect fine papers. Points of difference have always existed in the industry but today's conditions, in respect to pulp, have brought them into very sharp focus and drawn economic battle lines very sharply. There are quite a few mills working less than a full week and some to a degree that is so punishing that future existence could be at stake. On a certain very widely used grade of paper involving rather large tonnage, August quotations from five sources varied as much as 30 percent. An inspection of G.P.O. (third-quarter bids—*ed.*) bids reveals an equally erratic pricing schedule. Previously, when these conditions existed, price reductions came into effect almost immediately.

It is expensive to operate a mill three or four days a week. A price reduction has, in the past, cost less than the unabsorbed burden resulting from reduced operation. Erratic pricing has also in the past shortly resulted in a new price basis to which the industry held within rather close limits for an interlude. With many factors present that have historically resulted in price reductions, buyers are entitled to look behind the scenery to see just what kind of props are holding it up.

The most visible prop is pulp. Its ownership or control is, under today's conditions, an extremely potent weapon. It is being used wholeheartedly, skillfully and ruthlessly, to open new markets, expand present markets and to consolidate future markets. Never has the economic climate been more favorable for such an adventure and never have available openings been exploited so efficiently.

Those who own or control pulp do so at prices much less than the $125-$175-ton range that much of their competition, numerically, have to pay. The price level necessary for the minimum existence of that part of the industry which must buy market pulp provides a very ample and generous umbrella for that part of the industry which produces or controls its own pulp.

It means, for the currently more fortunate part of the industry controlling pulp, that, as soon as their break-even point is covered, if necessary, they can price paper from then on to recover direct labor and pulp costs only, since the monthly burden or overhead has already been absorbed. If the regular prices are based on 70 percent capacity, beyond that point prices could be cut to the bare pulp and direct labor costs. That is one of the ways by which such widely divergent pricing may happen.

The support furnished the pulp market, by dissolving pulps and other uses, forms one of the strongest props. If that eases or falls off with the demand for paper at its present or lower level paper prices should rather promptly reflect such changed conditions and those mills who now find it cheaper to absorb the losses resulting from less than a full week's operation would undoubtedly explore the possibilities that lower prices would offer in getting mills back to a full week's production.

Newsprint

By T. A. CORCORAN

The price increase that was rumored at the time of our last report has come about. The figure generally adopted is four dollars, bringing the price per ton to $100, delivered at New York. One exception increased its price by only three dollars, thus keeping its price under that of the Canadian and most U. S. mills. It has been suggested that $100 is a good round figure at which to stop the spiral. However, none of the mills has named the price for any definite period.

Consumption by all U. S. users amounted to 381,238 tons in July, an increase of 8.4 percent over July, 1947. For seven months, it totaled 2,939,791 tons, up 11.1 percent over the same period of 1947. Total U. S. *supply* in July was 438,785 tons, an increase of 2 percent over July a year ago. Supply for seven months has amounted to 2,953,136 tons, exceeding the similar period a year ago by 7.35 percent.

Total North American *stocks* increased 73,128 tons during July, to 676,186 tons. It represented, however, a decrease of 2,465 tons from the same date last year. Five hundred and twenty-five newspapers, reporting to the American Newspaper Publishers Ass'n., had 44 days' supply on hand at the end of July, compared to 34 days' a month earlier and 41 days' a year ago.

Boxboard

By STUART EDGERTON
United States Rubber Co.
New York City

Little change since last report. This material can be obtained on 10-day lead time. Quality had steadily improved. There has been no change in prices.

Paper Containers

By LEE R. FORKER
Quaker Stock Oil Ref'g. Corp.
Oil City, Pa.

The trend to improve quality continues for paper containers. Better availability of quality kraft, even though limited in certain areas, is permitting a change in specifications of paper containers, including corrugated paper boxes, increasing the factor of safety for shipment with a 10 percent to 15 percent increase on the Mullen bursting strength minimum as required by Rule 41.

Competition is increasing, indicating better availability, and, in some cases, improved specifications are available at no increase in cost.

Paper shipping drums likewise are readily available, with improved quality at approximately identical costs to

those in effect 30 days ago, although sheet steel remains short for head stock.

It is anticipated that the trend will continue for improved quality and general availability.

Wood Pulp

By H. L. WEBER
Fibreboard Products, Inc.
San Francisco, Calif.

The pulp supply picture has eased since our last report.

There seems to be an adequate supply of pulp in all but the bleached grades, which are still somewhat tight. There are fewer shortages of various grades than we have experienced. Whether the supply is in excess of demand is questionable. To assume that this will continue one must forget that thus far this year one grade of pulp in short supply a few months later eases off, while a pulp that has been relatively easy to get, in a few months becomes tight. The consumption of pulp is still holding up, but is tending to flatten out.

The main change in the pulp picture is in the price side, particularly with relation to unbleached sulphate. Here the Scandinavian and Finnish producers still are holding pulp at prices that domestic consumers are unwilling to pay. There are indications that unless these Scandinavian producers can sell their pulp elsewhere and obtain American dollars they may be forced to reduce their fourth-quarter prices, if they are going to ship in present large amounts during the fourth quarter. Present domestic and Canadian prices will, in all likelihood, remain firm for the balance of the year.

Kraft Paper

By T. H. TREADWELL
W. C. Ritchie & Co.
Chicago, Ill.

In spite of added productive capacity, kraft paper remains tight, although not so acute as several months ago. Dealers and large users are still on allotment. The continued, increasing demand for multiwall bags is an important factor in the kraft market.

Some of the southern mills have recently increased base price 50 cents per hundredweight and decreased cash discount. The increase is the result of higher cost of freight on wood and other raw materials, and increased wages.

Certain mills have also advised of contemplated increase in price differentials for lightweights, sheeting, trimming and casing.

West Coast Conditions

By HORACE DUCKENFIELD
Metropolitan Life Insurance Co.
San Francisco, Calif.

There is quite some satisfaction among paper dealers in the West reporting that the supply in all lines of printing paper seems to be in a very healthy condition on nearly all grades, though the report also discloses a wave of rising prices.

High-grade rag content bond has followed the trend of rising prices, as have some bristols and envelopes.

At present, the majority of sulphite bonds and book papers have not been subjected to the raise.

It will probably be 90 days or more before conditions get back to normal in the wrapping paper field, which embodies also kraft and bags, on account of the recent disastrous floods in Oregon. Prices on kraft products appear to be very strong.

The supply of tissue is definitely improving and cartons seem to be in very good supply.

Crown-Zellerbach Lauded

(Continued from page 7)

bach is good, the authors and the Committee warn that, "The existence of peace in this industry is not assured for the future. One of the major sources of insecurity and a potential disruptive factor has been rival unionism. New uncertainty has been introduced by the Taft-Hartley Act which gives preference for craft bargaining units. This could threaten the industry-wide bargaining mechanism which has functioned so successfully in the industry as an instrument of industrial peace. In this complex industry as many as 15 to 20 individual craft unions might become involved, each with its separate contract and possibly conflicting aspirations. Instead of single negotiations, there might be many negotiations to conduct, jurisdictional rivalries, and greater possibilities of strikes."

In its statement, the Committee expressed gratitude for the "confidence and support of John Hay Whitney, whose generosity and vision" have made this project possible. It states that Mr. Whitney does not "bear any direct responsibility for details in the *Case Studies* nor the conclusions drawn from them. Such responsibility rests with the authors and this committee."

Anniversary Book Review

NEW YORK—International Paper Co., on September 16 held an invitation "special preview for friends of the graphic arts" of its Anniversary Book, "International Paper Co., after 50 Years," at the galleries of the Associated American Artists, 711 Fifth avenue.

The anniversary book is being printed in an English edition of 105,000 copies and a French edition of 10,000 copies for distribution to employes, shareholders and other friends of the International Paper Co.

It was designed by Louis J. Ansbacher, with color maps, end-papers and cover medallion by Boris Artzybasheff, color charts by other well-known artists, and photographs by Gabriel Benzur, Kosti Ruohomaa, William Vandivert, Werner Woolf, Margaret Bourke-White and others.

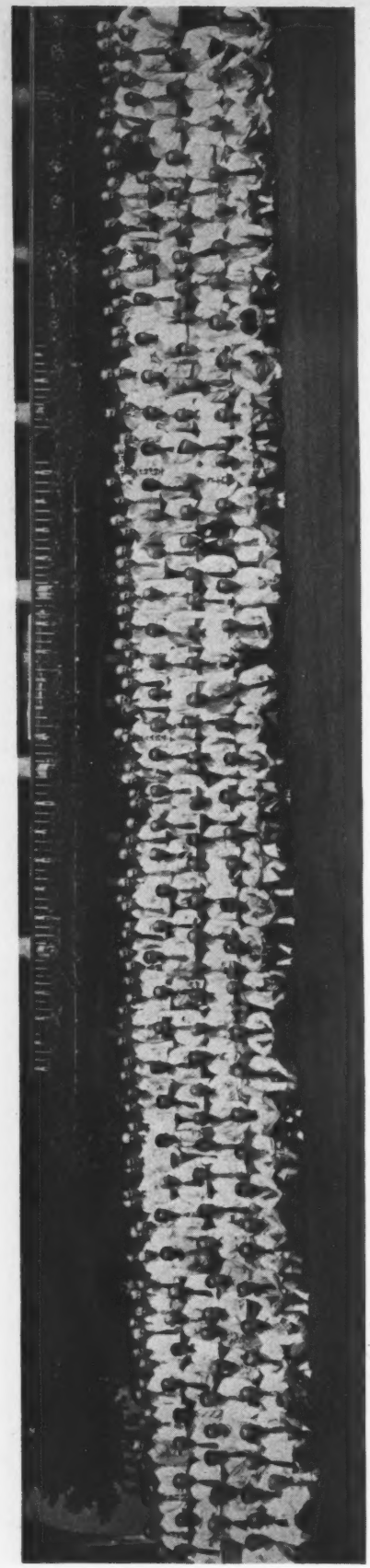
The book is being printed in letterpress, gravure and offset by the Beck Engraving Co. in Philadelphia; Lakeside Press, Chicago, and Rogers-Kellogg-Stillson, Inc., in New York. Typography is by Frederic Nelson Phillips, Inc. Binding by Russell-Rutter Co., Inc. The original artwork was shown at the preview with the color reproductions and color progression proofs, plates and press forms and a preview copy of the book was presented to each guest.

T. CECIL DAVIS

—recently named as assistant secretary and assistant treasurer of the St. Regis Paper Co., (Canada) Ltd. Mr. Davis is a chartered accountant and has had a varied experience in accounting and financial matters. During World War II he was Director of Accounts and Finance, RCAF overseas. He was promoted to the rank of Group Captain in September 1943, and was retired to the Reserve in December 1945 with that rank. Since that time, he has been associated with Canadair, Ltd., and Bruck Silk Mills, Ltd., in senior accounting posts.

ECA OK's $12,286,350

WASHINGTON — Pulp and paper procurement authorizations by the Economic Cooperation Administration total $12,286,350 to date, the agency reported on September 13. This total includes $63,000 for machinery for Norway's paper and pulp industry announced September 6.



Hammermill Agents Meeting

Herewith is a list of Hammermill agents who attended the 35th Annual Conference of Hammermill Agents held at Erie, Pa., late in August, as reported on Page 54 of the September 9 issue of *Paper Trade Journal*.

Alling & Cory Co., Buffalo, Herbert S. Kratz; Cleveland, Lester L. Nickels, Robert E. Michael and F. Earle Windows; New York, C. W. Stuyvesant and H. K. Weed; Pittsburgh, Josef H. Buerger; Rochester, Harold L. Austin, Thomas R. White and A. Robert Patchen; Syracuse, George Litzenberger; Utica, Royston F. Spring; R. P. Andrews Paper Co., Washington, D. C., George B. Kennedy, Edwin W. Gross and Wm. N. Schaefer; Andrews Paper House of York, York, Pa., B. R. Moore; Antietam Paper Co., Inc., Hagerstown, Md., M. Kiesewetter.

Beacon Paper Co., St. Louis, C. S. Lafferty; Beecher, Peck & Lewis—Detroit; G. A. Naumann, R. W. Roehm, A. E. King and Robert Hendley; Flint; E. L. Kramer; Beekman Paper & Card Co., Inc., New York City, Theodore Greenebaum; John Boshart Paper Co., Duluth, Edward W. Johnson; Bouer Paper Co., Milwaukee, J. J. Imbolz and L. A. Ramaker; Bulkley, Dunton & Co., Inc., New York City, J. O. Bulkley, J. C. Marvin and R. E. Estes; Bulkley, Dunton & Co., Div. of Carter Rice & Co. Corp., Springfield, Mass., John R. Whitney; Butler Paper Co., Fort Wayne, Roscoe Taylor; Capital City Paper Co., Springfield, Ill., S. B. Gaines.

Carpenter Paper Co., Grand Rapids, L. V. Mulnix and L. V. Mulnix, Jr.; Kansas City, Kirby G. Cook; Dallas, R. R. Moser; Omaha, Dewey A. Hoadley and Perdin D. Handley; Carter, Rice & Co. Corp., Boston, Courtney Reeves, Robert Welsh and Frank H. Winter; Caskie Paper Co., Inc.—Charlotte, N. C., Hugh G. Boyer; Lynchburg, Va., G. E. Caskie, Jr.; Central Ohio Paper Co.—Columbus, A. M. Miller and William F. Boothby; Toledo, W. G. Glass; Chicago Paper Co., Chicago, G. Forrest Gillett and W. A. Stockbarger; Clements Paper Co., Nashville, Charles H. Williams; Copco Papers, Inc., Charleston, W. Va., T. P. Bateman.

Crescent Paper Co., Champaign, Ill., Harry M. Cruse; Crescent Paper Co., Indianapolis, Ind., E. P. Magel, Carl Rusie, George Seidensticker; Daka Paper Co., Erie, Dana Payne, Ed Ulrich and H. S. Wuenschel; Decatur Paper House, Inc., Decatur, Ill., Lyle Harris and Pat Harrington; Diem & Wing Paper Co., Cincinnati, Roy E. Dieterlen, P. A. Stuhlreyer, Jr. and J. H. Schneider; Dudley Paper Co.—Lansing, Charles M. Yates and Donald Holmes; Saginaw, Berford Barber; Durico Paper Co., Erie, G. J. Kuebel and G. J. Kuebel, Jr.; Epes-Fitzgerald Paper Co.—Columbia, S. C., J. H. M. Fitzgerald; Richmond, Va., T. H. Epes, Jr.; Charles A. Esty Paper Co., Div., Worcester, Mass., Merton C. Flemings; Garrett-Buchanan Co., Reading, G. Taylor Sykes and C. Raymond Smith; Green & Low Paper Co., Inc., New York City, A. W. Green; R. L. Greene Paper Co., Providence, Walter P. Jones; Hubbs & Howe Co.: Buffalo, F. W. Howe, T. W. Utterbach, W. G. Landers, Carl Abbey, Donald Smith, Barney Smith, Emil Hoffman and E. T. Olsen; Hudson Valley Paper Co., Albany, N. Y., Richard H. VanLaer, John B. Binley and Sydney T. Jones.

Irwin Paper Co., Quincy, Ill., George Irwin and E. A. Damhorst; Jackson Paper Co., Jackson, Miss., H. T. Newell, Sr.; Johnston, Keffer & Trout, Harrisburg, Pa., Brook Trout and Wm. N. Devenney; Lathrop Paper Co., Inc., New York City, T. S. Lathrop, T. J. Thumser and Allen C. Swenken; Lehigh Valley Paper House, Div., S. Walter, Inc., Allentown, E. G. Parks; John Leslie Paper Co., Minneapolis, Frank P. Leslie, A. Wells Leslie, Jr. and Robert J. Armstrong; Henry Lindenmeyr & Sons—Newark, Harold Hurst; New York City, George F. Gray, E. E. Cole, Edward Sylvander and Fred Mosher; Megargee Brothers, Inc., Scranton, James P. O'Connor; Midwestern Paper Co., Kansas City, Z. D. Milledge; Miller Paper Co., Inc., Louisville, Gerald Allgeier; Miller & Wright Paper Co., New York City, Robert Schmidt; Newell Paper Co., Meriden, Miss., Harvey Newell, Jr.; E. C. Palmer & Co., Ltd., New Orleans, F. W. Canaday and Tom Johnson; E. C. Palmer & Co., Ltd.—Houston, W. W. Carter, Jr.; Miami, Charles R. Flynt; Tampa, Milton D. Bradford; Dallas, Stewart R. Rivers; Paper Merchants, Inc., Philadelphia, W. Predmore, Harry M. Rambo and John H. Luff; Peoria Paper House, Inc., Peoria, Lee Young and Harold Kappler; Petrequin Paper Co., Cleveland, H. F. Petrequin, E. J. Petrequin, Bob Petrequin and R. G. Estes; Thomas W. Price Co., Philadelphia, Norman W. Fort, Jr., William C. Kramer, John M. Strine and J. Edwin Kay; Rheinhold-Gould, Inc., New York City, Harry E. Gould; S. P. Richards Paper Co., Atlanta, A. Warren Rhodes; S. P. Richards Paper Co., Montgomery, Ala., Tom Weaver; Richmond Paper Co., Inc., Richmond, Va., Ernest C. Mead; Rourke-Eno Paper Co., Hartford, Frank W. Holden and George L. Ray.

Bradner Smith & Co., Chicago, F. W. Sinsabaugh and F. A. Zagornick; Southeastern Paper Co., Inc., Louisville, Harry E. Harris, Freeman D. Micou and Elmer Beck; Springfield, Paper Co., Springfield, Mo., Ross and George Likins; Storrs & Bement Co., Boston, W. N. Stetson, Jr., Paul M. Jones and John F. Raymond; Storrs & Bement Co., New Haven, A. J. Stevens, Jr.; Strickland Paper Co., Inc., Birmingham, Guy Wortham; Swigart Paper Co., Chicago, J. D. Swigart, E. A. Rohrer and J. J. Lukaska; Tayloe Paper Co., Memphis, Tom Holloman; Tayloe Paper Co. of Oklahoma, Tulsa, Virgil Buzard; Tobey Fine Papers, Inc., St. Louis, C. A. Sigman; Union Card & Paper Co., New York City, Benjamin and Robert Glickenhaus.

Virginia Paper Co., Inc., Jacksonville, Stuart H. Richeson; D. L. Ward Co., Philadelphia, Ralph G. Luff, David L. Ward, John D. Williams, D. Kipp Conover and C. A. O'Neill; O. F. H. Warner & Co., Inc., Baltimore, Douglas Warner; Western Newspaper Union—Little Rock, Carl F. Seiffert; Shreveport, Ed Winters; Sioux City, Lloyd W. Peck; Oklahoma City, Claude Thomas; Salt Lake City, Harry Deardorff; Wichita, Ralph N. Eaton; New York City, W. W. Brown; Omaha, E. L. Walters; R. D. Wilson Sons & Co., Clarksburg, W. Va., Mark D. Wilson; Wyant & Sons Paper Co., Atlanta, Wm. K. Wyant; Zellerbach Paper Co., San Francisco, Allan R. Newmark; Gomba & Hermosura, Inc., Manila, P. I., Pedro J. Gomba; Muller & Phipps (Asia) Ltd., New York City, E. A. Phipps and J. E. Singleton, Jr.; Cia. Riera, Toro & Van Twistern, S. A.—Havana, F. G. Tous; New York City, F. Eissler.

Walker, Goulard, Plehn Co., Inc., New York City, Elwin Walker, Amadeo Ferrer, Albert Carus and Ernest Ceijas; Central States Envelope Co., Div., Indianapolis, Ind., H. J. Schweitzer; Kellogg Envelope Div., Springfield, Mass., E. L. Wood and C. W. Savage; National Envelope Co., Div., Waukegan, Ill., Charles T. Roos; United States Envelope Co.—Springfield, Mass., E. V. Johnson, M. F. Peterson, J. S. Fairchild, F. H. Sellars, Jr., E. L. Wight and R. W. Morrissey; Atlanta Div., Doraville, Ga., A. A. Baron.

A useful guide to better results with Stainless

Here in convenient form we have condensed the essential facts about the various grades of U·S·S Stainless Steel that will assist you in determining broadly which is most suitable for your needs. Keep in mind, however, that this chart merely indicates general characteristics and basic applications.

To get *optimum* results from these service-tested Stainless Steels, any fabricator, and especially any one contemplating the use of Stainless for a new product, should obtain expert advice in its selection and fabrication. This we are prepared to furnish.

Our Stainless engineers are specialists in the use of these materials. Ask for their cooperation. You'll find their suggestions practical and extremely helpful not only in determining the grade of U·S·S Stainless that will do the best job for you, but in showing how it can be handled most efficiently on your equipment.

15 types of U·S·S Stainless Steel to choose from

	grade	characteristics	when or why used
austenitic	U·S·S 18-8 Type 302	Excellent corrosion resistance.	General all-purpose grade for food, dairy, chemical, and architectural uses.
austenitic	U·S·S 18-8 S Type 304	Carbon is limited to 0.08% maximum.	For applications similar to U·S·S 18-8 Type 302, but offers superior corrosion resistance in weld-affected areas.
austenitic	U·S·S 18-8 Ti Type 321 U·S·S 18-8 Cb Type 347	Similar in general corrosion resistance to U·S·S 18-8 and U·S·S 18-8 S. Stabilizing additions immunize corrosion attack of heat-affected areas.	High temperature service, 800°F to 1600°F. For severe corrosion conditions in welded assemblies which cannot be subsequently annealed.
austenitic	U·S·S 18-8 Mo Type 316	Exceptional corrosion resistance, improved creep strength.	Severe corrosive conditions, particularly those involving pit-type corrosion.
austenitic	U·S·S 18-8 FM Type 303	Galling and seizing reduced, machining greatly improved.	Gears, valves, bolts, screws, or other machined products.
austenitic	U·S·S 25-12 Type 309	Exceptionally stress resistant at high temperature exposure.	In service where temperatures up to 1900°F are encountered.
austenitic	U·S·S 25-20 Type 310	Offers superior resistance to oxidation.	Applied where very high temperatures are involved.
ferritic	U·S·S 17 Type 430	Good corrosion resistance.	Automotive and interior architectural trim; some specific chemical applications.
ferritic	U·S·S 27 Type 446	Limited formability, generally not adapted to severe drawing. Excellent scaling resistance.	Principally used at high temperatures up to 2000°F for static parts not subjected to high stress.
ferritic	U·S·S 12 Type 410	Martensitic grade, strengthened by conventional heating and quenching.	Engaging mechanical parts, such as pump rods and valves.
ferritic	U·S·S 12 Turbine Type 403	Composition basically same as U·S·S 12.	Modified analysis suited for turbine blades and similar application.
ferritic	U·S·S 12 AL Type 405	Composition basically same as U·S·S 12.	Modified analysis for applications requiring field welding where air-hardening cannot be corrected by heat treatment.
ferritic	U·S·S 12 FM	Added elements give extra machinability over U·S·S 12.	Used for valve parts and other articles made on automatic machines.
ferritic	U·S·S 5 Type 501	Welding hardens; annealing restores ductility.	Used in petroleum industries for strength, and resistance to corrosion and oxidation at moderately high temperatures.
ferritic	U·S·S 5 S Type 502	Basically same as regular U·S·S 5.	Modified analysis reduces tendency to weld-harden.

forms available

SHEETS are supplied in plain or polished finishes which are standardized. They are designated as: No. 1—Hot Rolled, Annealed, and Pickled; No. 2D—Dull Cold Rolled; No. 2B—Bright Cold Rolled; No. 4—Standard Polish on either One or Both Sides; No. 6—Tampico Brushed; No. 7—High Luster Polished.

STRIP is supplied to ordered requirement in coils or straightened and cut lengths. It should be ordered to a decimal thickness, with width and finish to suit the particular application.

PLATES AND BARS are furnished hot rolled, annealed, and pickled; bars are also furnished cold finished, centerless ground, or polished. Special sections and plates are furnished with pickle finish and require coarse abrasives in preliminary grinding, where a polish is desired.

TUBULAR PRODUCTS are furnished in most popular grades of U·S·S Stainless Steel. A variety of finishes are obtained by grinding and polishing cold drawn, annealed, and pickled tubing.

ROUND WIRE is available in coils within a size range of .5" to .005" inclusive. Straightened and cut material is limited to .030" and coarser. Finishes available include pickled, metallic coated, oil, diamond, and soap drawn, ground, and polished. A variety of cold heading wire, spring wire, weaving wire, armature binding wire, and wire rope are also available in stainless steels.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK
5-1039

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

UNITED STATES STEEL

Congress Opens Industry's Bids On Fourth Quarter Paper Need

WASHINGTON, Sept. 13 — Bids were received today by the Joint Congressional Committee on Printing for paper for the use of the Government Printing Office for a three months' period beginning October 1, 1948. Awards are to be announced September 20. The bids were as follows:

Newsprint

No. 1—2,000,000 lbs., 24x36—64; rolls, 19, 24, 36, and 48 ins. wide, 36 inches in diameter (3-inch fiber cores).

Walker Goulard Plehn Co. ..... .0899c

Catalog News

No. 2—50,000 lbs., 24x36—45; rolls, 28, 38, and 48 ins. wide, 36 ins. in diameter (3-inch fiber cores). (Weight of cores and wrappers shall be included in the net weight.)

Machine-Finish Book

No. 3—50,000 lbs., 25x38—70; flat, cut any size, min. 21 ins., max. 48 ins.

Stanford Paper Co. ..... .1205c
Barton, Duer & Koch Paper Co. .. .1161c
Mead Sales Co. ..... .1167c
Paper Corp. of U. S. ..... .1114c

No. 4—350,000 lbs., 25x38—70; flat, cut 24x38, 28x38, and 38x48 ins.

Stanford Paper Co. ..... .1205c
Barton, Duer & Koch Paper Co. .. .1161c
Mead Sales Co. ..... .1167c
Paper Corp. of U. S. ..... .1114c

No. 5—350,000 lbs., 25x38—70; flat, cut 24x38, 28x38, and 38x48 ins.

Stanford Paper Co. ..... .1205c
Barton, Duer & Koch Paper Co. .. .1161c
Mead Sales Co. ..... .1167c
Paper Corp. of U. S. ..... .1114c

No. 6—150,000 lbs., 25x38—70; flat, cut 28½ ins. wide, 36 inches in diameter (3-inch fiber cores).

Walker Goulard Plehn Co. (Contingent on receiving award for Lot 9.) ..... .0998c
Stanford Paper Co. ..... .1117c
Barton, Duer & Koch Paper Co. .. .1075c
Mead Sales Co. ..... .1069c
Mudge Paper Co. ..... .1082c
Paper Corp. of U. S. ..... .1039c

No. 9—100,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide, 36 inches in diameter (3-inch fiber cores).

Walker Goulard Plehn Co. ..... .0998c
Stanford Paper Co. ..... .1117c
Barton, Duer & Koch Paper Co. .. .1075c
Mead Sales Co. ..... .1072c
Mudge Paper Co. ..... .1082c
Paper Corp. of U. S. ..... .1039c

English-Finish Book

No. 10—40,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

Stanford Paper Co. ..... .0998c
Barton, Duer & Koch Paper Co. . .101c
Paper Corp. of U. S. 1063c

Machine-Finish Book End Paper

No. 17—50,000 lbs., 25x38—160; flat, cut 38x50 ins.

Walker Goulard Plehn Co. ..... .1369c
Mead Sales Co. ..... .1089c

Offset Book

No. 18—330,000 lbs., 25x38—80; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Walker Goulard Plehn Co. ..... .1215c
R. P. Andrews Paper Co. ..... .1456c
Central Ohio Paper Co. ..... .1398c
Paper Corp. of U. S. ..... .1241c

No. 19—600,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

Walker Goulard Plehn Co. ..... .1135c
R. P. Andrews Paper Co. ..... .1252c
Stanford Paper Co. ..... .1239c
Central Ohio Paper Co. ..... .1226c
Whitaker Paper Co. ..... .1147c
Mudge Paper Co. (200,00 lbs. only). ..... .12c
Paper Corp. of U. S. ..... .1171c

Offset Poster

No. 20—80,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

Walker Goulard Plehn Co. ..... .1312c
R. P. Andrews Paper Co. ..... .1164c
Stanford Paper Co. ..... .1153c
Paper Corp. of U. S. ..... .1141c

Antique Book

No. 21—40,000 lbs., 25x38—90; flat, cut 32x42, 33x43, and 38x50 ins.

Walker Goulard Plehn Co. ..... .1355c
R. P. Andrews Paper Co. ..... .0921c
Stanford Paper Co. ..... .1023c
Barton, Duer & Koch Paper Co. .. .1035c
Mead Sales Co. ..... .1089c
Paper Corp. of U. S. ..... .1074c

No. 22—80,000 lbs., 25x38—120; flat, cut 32x42, 33x43, and 38x50 ins.

Walker Goulard Plehn Co. ..... .1235c
R. P. Andrews Paper Co. ..... .0921c
Stanford Paper Co. ..... .0955c
Barton, Duer & Koch Paper Co. .. .1035c
Mead Sales Co. ..... .1089c
Paper Corp. of U. S. ..... .1074c

50% Antique Book

No. 26—90,000 lbs., 25x38—80; flat, cut 32x48 and 38x48 ins.

Walker Goulard Plehn Co. ..... .1667c
Birmingham & Prosser Co. ..... .1815c
Wilcox-Walker Furlong Paper Co. .199c
Mathers-Lamm Paper Co. ..... .1798c
Old Dominion Paper Co. ..... .18162c
Quaker City Paper Co. ..... .1898c
Mudge Paper Co. ..... .1818c
Paper Corp. of U. S. ..... .1649c
John W. McNeil, Inc. ..... .15949c
Howard Paper Mills (Aetna Div.) .1678c

No. 27—40,000 lbs., 25x38—80. Shall be suitable for writing on with ink. Flat, cut 22¼x31 ins.

Walker Goulard Plehn Co. ..... .1667c
Birmingham & Prosser Co. ..... .1815c
Wilcox-Walker Furlong Paper Co. .199c
Mathers-Lamm Paper Co. ..... .1798c
Old Dominion Paper Co. ..... .18162c
Quaker City Paper Co. ..... .1898c
Mudge Paper Co. ..... .1818c
Paper Corp. of U. S. ..... .1649c
John W. McNeil, Inc. ..... .15949c
Howard Paper Mills (Aetna Div.) .1678c

Supercalendered Book

No. 33—60,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

R. P. Andrews Paper Co. ..... .1022c
Stanford Paper Co. ..... .1118c
Mead Sales Co. ..... .1187c

Coated Book

No. 35—430,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. .. .1156c
Mead Sales Co. ..... .1157c

No. 36—110,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. .. .1156c

No. 40—300,000 lbs., 25x38—140; flat, cut 28x41, 32x42, 38x48, 39x50, and 41x52 ins.; the grain to run lengthwise of the sheet.

Walker Goulard Plehn Co. (150,000 lbs. only.) ..... .1305c
Birmingham & Prosser Co. (150,000 lbs. only.) ..... .1315c
Butler Co. ..... .1332c
Consolidated Water Power & Paper Co. ..... .1096c
Mead Sales Co. ..... .1145c

Dull Coated Book

No. 42—50,000 lbs., 25x38—140; flat, cut 32x42 and 38x48 ins.; the grain to run lengthwise of the sheet.

Walker Goulard Plehn Co. ..... .1352c
Stanford Paper Co. ..... .1427c
Old Dominion Paper Co. ..... .1394c
Mudge Paper Co. ..... .1369c

Chemical Wood Mimeograph, White and Colored

No. 44—500,000 lbs., white. No. 40. Flat, cut 28½x34½, 32½x42½, and 38x48½ ins. Grain: Size 28½x34½ ins., to run the 28½ inch way; size, 32½x42½ to run the 42½ inch way; size 38x48½ ins., to run the 38 inch way.

Walker Goulard Plehn Co. ..... .1124c
R. P. Andrews Paper Co. ..... .1063c
Stanford Paper Co. ..... .105c
Barton, Duer & Koch Paper Co. .. .1215c
Central Ohio Paper Co. ..... .1244c
Whitaker Paper Co. ..... .1199c
Paper Corp. of U. S. ..... .117c

No. 45—40,000 lbs., blue, buff, green, pink, and yellow, No. 40. Flat, cut 32½x42½, and 38x48½ ins. Grain: Size 32½x42½ to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way. Min. order, one color, 10,000 lbs.

Walker Goulard Plehn Co. ..... .121c
Birmingham & Prosser Co. ..... .1393c
Mathers-Lamm Paper Co. ..... .1383c
Old Dominion Paper Co. ..... .13974c
Mudge Paper Co. ..... .1398c

25% Mimeograph

No. 46—540,000 lbs., No. 40. Flat, cut 28½x34½, 32½x42½, 34½x44, 38x48½, and 40½x42½ ins. Grain: Size 28½x34½ ins. to run the 28½ inch way; sizes 32½x42½ and 40½x42½ ins. to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way.

Walker Goulard Plehn Co. ..... .1215c
Birmingham & Prosser Co. ..... .1715c
Bulkley Dunton & Co. ..... .1443c
Mathers-Lamm Paper Co. ..... .1697c
Butler Co. ..... .1368c
Old Dominion Paper Co. (270,000 lbs. only.) ..... .1346c
Old Dominion Paper Co. (270,000 lbs. only.) ..... .1366c
Whitaker Paper Co. (200,000 lbs. only.) ..... .1648c
Mudge Paper Co. .. .. .1717c
Paper Corp. of U. S. ..... .1355c
Chicago Paper Co. (First 340,000 lbs.) ..... .1294c
Howard Paper Mills(Aetna Div., 200,000 lbs.) ..... .1319c

Duplicator Copy Paper, Liquid Process, White and Colored

No. 47—500,000 lbs., white, No. 40. Flat, cut 32x42 and 34x44 ins.; the grain to run lengthwise of the sheet.

Walker Goulard Plehn Co. ..... .1436c
Birmingham & Prosser Co. ..... .1384c
Mathers-Lamm Paper Co. ..... .1377c
Stanford Paper Co. ..... .1365c
Old Dominion Paper Co. ..... .139238c
Quaker City Paper Co. ..... .1463c
Mudge Paper Co. ..... .1393c
Paper Corp. of U. S. ..... .1324c

(Continued on page 16)

"TRIUMPH" & "TRIUNE" 3 ply 50-54 oz. Cotton | "SCAPA HALL" Asbestos | "MULTIPLE WEAVE" 2 ply 52 oz. Cotton

A complete line of Dryer Felts for every kind of paper from finest tissues to heaviest Kraft:

BRANDON CORPORATION

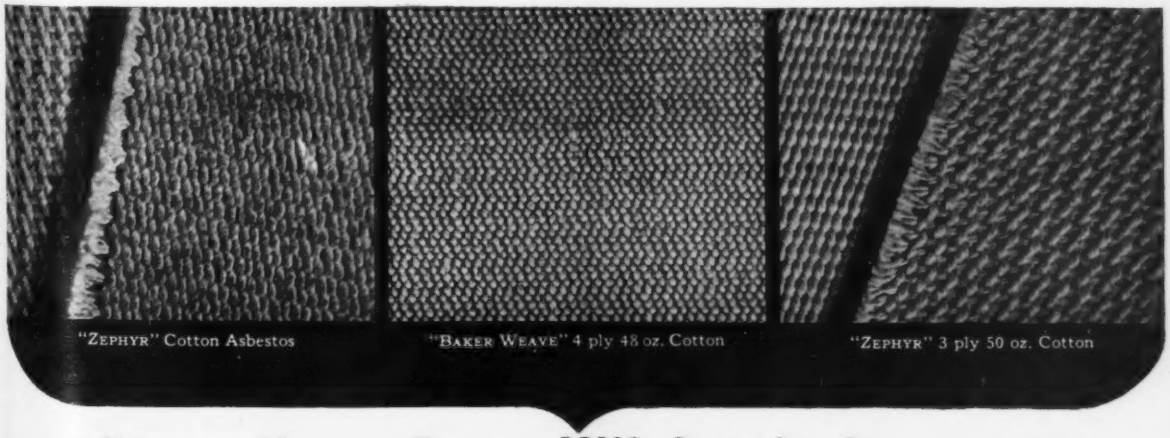
Greenville, S. C.

Manufacturers of "BRANDON" Cotton Dryer Felts and Brandon "SCAPA-HALL" Asbestos Felts

Special weaves are available in both Cotton and Asbestos Felts to improve the quality of your finish and quantity of production.

Quick service from 20 looms running two and three shifts per day.

Write us on your Dryer Felt problems. Instant reply and consultation are at your service.



"ZEPHYR" Cotton Asbestos | "BAKER WEAVE" 4 ply 48 oz. Cotton | "ZEPHYR" 3 ply 50 oz. Cotton

BRANDON DRYER FELTS

Morey Paper Mill Supply Co.

309 SOUTH ST., FITCHBURG, MASSACHUSETTS

Sole Distributors of Dryer Felts Manufactured by

BRANDON CORPORATION - Greenville, S. C.

BRANDON DRYER FELTS

GPO Bids

(Continued from page 14)

No. 48—60,000 lbs., pink, yellow, green, and blue, No. 40; flat, cut 32x42 and 34x44 ins.; the grain to run lengthwise of the sheet.

Birmingham & Prosser Co.	.1384c
Mathers-Lamm Paper Co.	.1377c
Stanford Paper Co.	.144c
Old Dominion Paper Co.	.13924c
Mudge Paper Co.	.1393c
Paper Corp. of U. S.	.1394c

Blue USMO Safety Writing

No. 49—100,000 lbs., No. 32. Rolls, 32 ins. wide, 24 ins. in diameter (3-inch fiber cores).

Walker Goulard Plehn Co. (50,000 lbs. only.)	.1944c
R. P. Andrews Paper Co.	.202c
D. L. Ward Co. (50,00 lbs. only.)	.2014c

Chemical Wood Writing, White and Colored

No. 51—150,000 lbs., white, No. 26. Flat, cut any size, min. width 21 ins., max width 48 ins.

Walker Goulard Plehn Co.	.1354c
Birmingham & Prosser Co.	.1445c
Mathers-Lamm Paper Co.	.1438c
Old Dominion Paper Co.	.14529c
Mudge Paper Co.	.1454c
Paper Corp. of U. S.	.1448c
Frank Parsons Paper Co.	.1395c

No. 52—2,000,000 lbs., white No. 32; flat, cut any size, min. width 21 ins., max width 48 ins.

Walker Goulard Plehn Co.	.1139c
R. P. Andrews Paper Co. (800,000 lbs. only.)	.1152c
Stanford Paper Co. (300,000 lbs. only.)	.128c
Barton, Duer & Koch Paper Co. (Total tonnage Lots 52 & 53 1,600,000 lbs.)	.1305c
Cauthorne Paper Co. (300,000 lbs. only.)	.133c
Whitaker Paper Co. (500,000 lbs. only.)	.1254c
Paper Corp. of U. S. (500,000 lbs. only.)	.1235c
Paper Corp. of U. S. (1,500,000 lbs. only.)	.1254c
D. L. Ward Co. (200,000 lbs. only)	.1205c
D. L. Ward Co. (200,000 lbs. only)	.1229c
D. L. Ward Co. (200,000 lbs. only)	.1254c
Frank Parsons Paper Co.	.1245c

No. 53—2,000,000 lbs., white No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Walker Goulard Plehn Co.	.1089c
R. P. Andrews Paper Co. (500,000 lbs. only.)	.1093c
Barton, Duer & Koch Paper Co. (Total tonnage Lots 52 & 53 1,600,000 lbs.)	.1245c
Cauthorne Paper Co. (500,000 lbs. only.)	.1244c
Whitaker Paper Co. (500,000 lbs. only.)	.1195c
Paper Corp. of U. S. (500,000 lbs. only.)	.121c
Paper Corp. of U. S. (1,500,000 lbs. only.)	.1195c
D. L. Ward Co. (200,000 lbs. only)	.1146c
D. L. Ward Co. (200,000 lbs. only)	.1171c
D. L. Ward Co. (200,000 lbs. only)	.1195c

No. 54—330,000 lbs., white, No. 32. Rolls, min. width 16 ins., 36 ins. in diameter, max. width 48 ins. (3-inch fiber cores).

Walker Goulard Plehn Co.	.0998c
R. P. Andrews Paper Co.	.1005c
Barton, Duer & Koch Paper Co.	.12c
Mead Sales Co.	.1177c
Whitaker Paper Co.	.1166c
Paper Corp. of U. S.	.113c

No. 55—100,000 lbs., white, No. 40; rolls, min. width, 16 ins., 36 ins. in diameter, max. width, 48 ins. (3-inch fiber cores).

Walker Goulard Plehn Co.	.0998c
R. P. Andrews Paper Co.	.0946c
Barton, Duer & Koch Paper Co.	.114c
Mead Sales Co.	.1118c
Whitaker Paper Co.	.1107c
Paper Corp. of U. S.	.1092c

No. 56—20,000 lbs., blue, buff, green, pink, salmon, and yellow, No. 26. Flat, cut any size, min. width 21 ins., max. width 48 ins.

No. 57—250,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow; No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins. Minimum order, one color, 10,000 lbs.

Walker Goulard Plehn Co.	.125c
Birmingham & Prosser Co.	.139c
Bulkley Dunton & Co.	.1343c
Mathers-Lamm Paper Co.	.1377c
Old Dominion Paper Co.	.13924c
Mudge Paper Co.	.1393c
Paper Corp. of U. S.	.131c

No. 58—70,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.

Walker Goulard Plehn Co.	.124c
Birmingham & Prosser Co.	.133c
Mathers-Lamm Paper Co.	.1318c
Old Dominion Paper Co.	.13318c
Mudge Paper Co.	.1333c
Paper Corp. of U. S.	.1285c

No. 61—50,000 lbs., white, No. 30. Rolls, 22 inch, 34 to 36 ins. in diameter (3-inch fiber cores).

Birmingham & Prosser Co.	.1098c
Mathers-Lamm Paper Co.	.1088c
Old Dominion Paper Co.	.10998c
Mudge Paper Co.	.1099c
Paper Corp. of U. S.	.1299c

No. 62—50,000 lbs., blue, green, pink and yellow, No. 24. Rolls, 22 inch, 34 to 36 inches in diameter (3-inch fiber cores).

Birmingham & Prosser Co.	.146c
Mathers-Lamm Paper Co.	.1447c
Old Dominion Paper Co. (270,000 lbs. only.)	.1462c
Mudge Paper Co.	.1464c

25% Lithograph-Finish Map

No. 69—40,000 lbs., No. 40. Flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Walker Goulard Plehn Co.	.17c
Franklin Research Co.	.1889c
R. P. Andrews Paper Co.	.2197c
Stanford Paper Co.	.1598c
Barton, Duer & Koch Paper Co.	.165c
Howard Paper Mills (Aetna Div.)	.1624c

50% Lithograph-Finish Map

No. 70—20,000 lbs., No. 32. Flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Franklin Research Co.	.212c
Stanford Paper Co.	.1644c
Howard Paper Mills (Aetna Div.)	.1799c

No. 73—100,00 lbs., No. 56. Flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Franklin Research Co.	.2087c
R. P. Andrews Paper Co.	.2397c
Stanford Paper Co.	.1745c
Barton, Duer & Koch Paper Co.	.1775c
Mudge Paper Co.	.16189c
Paper Corp. of U. S.	.1942c
Howard Paper Mills (Aetna Div.)	.1729c

High Wet Strength Map

No. 78—400,000 lbs., No. 48; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Birmingham & Prosser Co. (100,000 lbs. only.)	.1797c
Birmingham & Prosser Co. (300,000 lbs. only.)	.1995c
Mathers-Lamm Paper Co.	.196c
Stanford Paper Co.	.1783c
Barton, Duer & Koch Paper Co. (200,000 lbs. only.)	.1715c
Barton, Duer & Koch Paper Co. (200,000 lbs. only.)	.1748c
Old Dominion Paper Co.	.198248c
Cauthorne Paper Co.	.1871c
Mudge Paper Co. (100,000 lbs. only.)	.1797c
Paper Corp. of U. S.	.1725c
Howard Paper Mills (Aetna Div.)	.1728c

50% White Chart, Lithograph-Finish

No. 79—325,000 lbs., No. 72; flat, cut any size, min. width 22 ins., max. width 46 ins.; the grain to run lengthwise of the sheet unless otherwise specified.

Birmingham & Prosser Co.	.1817c
Franklin Research Co.	.2184c
Mathers-Lamm Paper Co.	.1795c
Stanford Paper Co.	.1925c
Barton, Duer & Koch Paper Co. (100,000 lbs. only.)	.1942c
Barton, Duer & Koch Paper Co. (125,000 lbs. only.)	.2042c
Old Dominion Paper Co.	.181518c
Mudge Paper Co.	.1816c
John W. McNeil, Inc. (100,000 lbs. only)	.19989c

Chemical Wood Manifold, White and Colored

No. 83—100,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.

Walker Goulard Plehn Co.	.164c
Paper Corp. of U. S.	.1705c
Frank Parsons Paper Co.	.1498c

No. 85—30,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 18. Flat, cut 28x34, 32x42, and 34x44 ins. Min. order, one color, 5,000 lbs.

Paper Corp. of U. S. (Minimum order 10,000 lbs.)	.1825c
Frank Parsons Paper Co. (10,000 lbs. minimum order)	.1598c

50% Manifold, White and Colored

No. 87—100,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.

Walker Goulard Plehn Co.	.286c
R. P. Andrews Paper Co.	.2655c
Barton, Duer & Koch Paper Co.	.22c
Butler Co.	.2089c
Old Dominion Paper Co. (40,000 lbs. only.)	.22429c
Old Dominion Paper Co. (40,000 lbs. only.)	.23919c
Paper Corp. of U. S.	.267c
Graham Paper Co.	.2024c

No. 89—10,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 18; flat, cut 28x34 and 34x44 ins. Min. order, one color, 5,000 lbs.

Walker Goulard Plehn Co.	.2941c
R. P. Andrews Paper Co.	.27c
Barton, Duer & Koch Paper Co.	.24c
Butler Co.	.25889c
Old Dominion Paper Co.	.24939c
Paper Corp. of U. S.	.271c

50% White Glazed Manifold

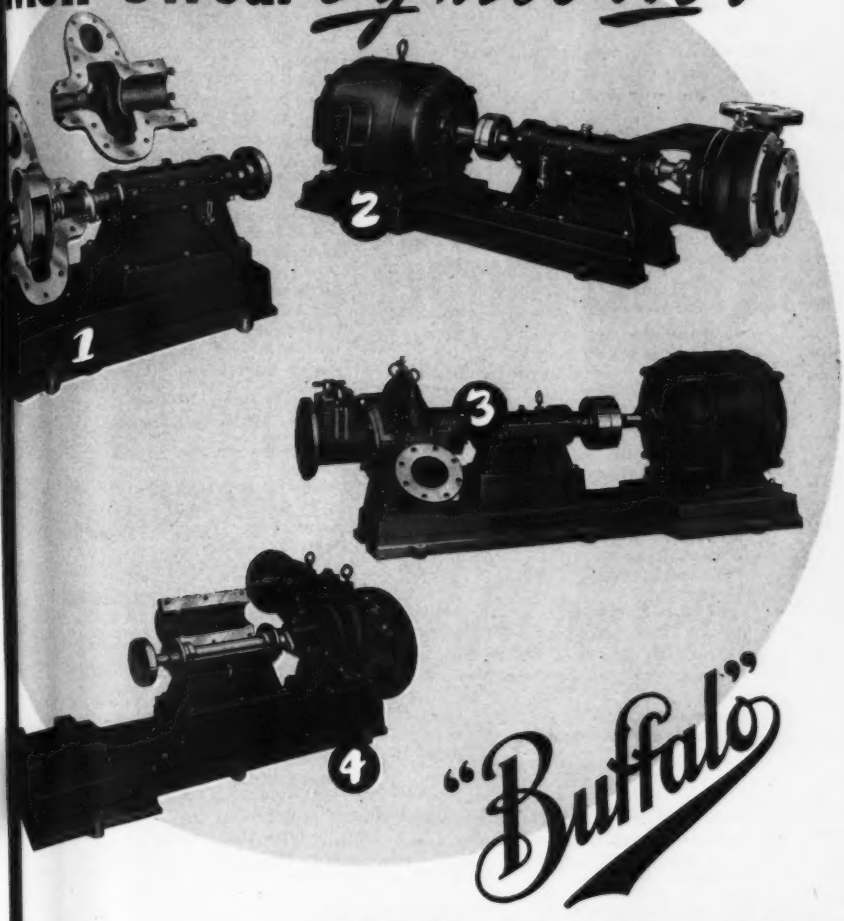
No. 91—20,000 lbs., No. 16. Flat, cut 32x42 ins. Min. order, 20,000 lbs.

Walker Goulard Plehn Co.	.3246c
R. P. Andrews Paper Co.	.2885c
Stanford Paper Co.	.30c
Barton, Duer & Koch Paper Co.	.25c
Butler Co.	.23789c
Paper Corp. of U. S.	.284c

(Continued on page 18)

CENTRIFUGAL PUMPS FOR EVERY SERVICE

Pick Pumps Your Maintenance Men Swear *By-not At!*



"Buffalo"

PAPER STOCK PUMPS

A pump that DOESN'T require a lot of attention and repairs is SAVING MONEY! That's why "Buffalo" Pumps are built with all oversize parts—built to deliver at full rated capacity for a good many years. Not only that, but they're built to stand the gaff in SPECIFIC PUMPING JOBS. There's a "Buffalo" Pump for the liquid, the head, the capacity your pumping job calls for—as illustrated by the pumps on this page. For the facts on these and other popular "Buffalo" Pumps, write now for BULLETIN 953-F.

1. FOR HIGH CONSISTENCY STOCK WITH LOW SUBMERGENCY—the "Buffalo" Diagonally Split-Shell Pump—very efficient, non-clogging and easy to service.

2. FOR HANDLING SIZE, LIME, CLAY SOLUTION, SILICATE OF SODA, MANY CORROSIVE LIQUIDS—the "Buffalo" Full Ball Bearing Single Suction Chemical Pump.

3. FOR HIGH-HEAD JOBS — the "Buffalo" Horizontally Split-Shell Single Suction Pump.

4. CORROSION-RESISTANT to many liquids, such as chlorinated solution and hydrochloric—the "Buffalo" Rubber-Lined Single Suction Pump.

PUMPS by "Buffalo"

For

WATER ANY TEMPERATURE

PAPER STOCKS (NON-CLOGGING)

GENERAL SERVICE

ACIDS

ALKALIS

SLURRY

CONDENSATE RETURN

SUMP CLEARANCE

FIRE SERVICE

SEWAGE

SELF-PRIMING SERVICE

BUFFALO PUMPS, INC.

159 MORTIMER STREET BUFFALO, N. Y.

Canada Pumps Ltd., Kitchener, Ont.

RUGGED, PRECISION CONSTRUCTION—FOR LONG LIFE

GPO Bids

(Continued from page 16)

Chemical Wood Bond, White and Colored

No. 102—100,000 lbs., No. 40; flat, cut any size, min. width 21 ins., max. 38 ins.

Walker Goulard Plehn Co.	.1446c
Birmingham & Prosser Co.	.123c
Mathers-Lamm Paper Co.	.1217c
Old Dominion Paper Co. (Minimum order 10,000 lbs.)	.1230c
Whitaker Paper Co.	.1364c
Mudge Paper Co.	.1232c
Paper Corp. of U. S.	.1274c
Howard Paper Mills (Aetna Div.)	.1337c

Chemical Wood White Mimeograph Bond

No. 104—40,0000 lbs., No. 40. Flat, cut 32½x42½ ins.; the grain to run lengthwise of the sheet.

Walker Goulard Plehn Co.	.1396c
Birmingham & Prosser Co.	.131c
Mathers-Lamm Paper Co.	.1298c
Old Dominion Paper Co.	.13117c
Mudge Paper Co.	.1313c
Howard Paper Mills (Aetna Div.)	.1337c

25% Bond, White and Colored

No. 105—60,000 lbs., white, No. 26. Flat, cut any size, min. width 21 ins., max. width 48 ins.

Stanford Paper Co.	.1722c
Barton, Duer & Koch Paper Co.	.19c
Butler Co.	.1718c
Graham Paper Co.	.192c
Howard Paper Mills (Aetna Div.)	.1794c

No. 106—150,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Birmingham & Prosser Co.	.15239c
Stanford Paper Co.	.1572c
Graham Paper Co. (50,000 lbs. only.)	.1569c
Howard Paper Mills (Aetna Div.)	.1563c

No. 107—150,000 lbs., No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Birmingham & Prosser Co.	.15239c
Stanford Paper Co.	.1572c
Barton, Duer & Koch Paper Co.	.16c
Howard Paper Mills (Aetna Div.)	.1563c
Frank Parsons Paper Co. (50,000 lbs. only)	.1589c

No. 108—150,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Stanford Paper Co.	.1572c
Mudge Paper Co.	.15239c
Howard Paper Mills (Aetna Div.)	.1571c
Frank Parsons Paper Co. (50,000 lbs. only)	.1589c

No. 109—320,000 lbs., No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Butler Co. (160,000 lbs. only.)	.1468c
Mudge Paper Co. (160,000 lbs. only.)	.1468c
Howard Paper Mills (Aetna Div.)	.1507c
Frank Parsons Paper Co. (120,000 lbs. only)	.1491c
Frank Parsons Paper Co. (100,000 lbs. only)	.1516c
Frank Parsons Paper Co. (100,000 lbs. only)	.1541c

No. 113—40,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 32. Flat, cut any size, min. width 21 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co.	.163c
John W. McNeil, Inc.	.1619c
Howard Paper Mills (Aetna Div.)	.1658c

No. 121—20,000 lbs., white, No. 32. Flat, cut any size, min. width 21 ins., max. width 35 ins.

Birmingham & Prosser Co.	.1684c
Bulkley Dunton Co.	.1965c
Barton, Duer & Koch Paper Co.	.195c
Whitaker Paper Co.	.20c
Chicago Paper Co.	.1655c
Howard Paper Mills (Aetna Div.)	.1933c

Chemical Wood White Ledger

No. 150—160,000 lbs., No. 48. Flat, cut any size, min. width 17 ins., max. width 48 ins.

Walker Goulard Plehn Co.	.1396c
Birmingham & Prosser Co.	.141c
Mathers-Lamm Paper Co.	.1397c
Old Dominion Paper Co.	.14124c
Whitaker Paper Co.	.1334c
Mudge Paper Co.	.1414c
Paper Corp. of U. S.	.1313c
Howard Paper Mills (Aetna Div.)	.1348c

No. 151—40,000 lbs., No. 64; flat, cut any size, min. width 17 ins., max. width 48 ins.

Walker Goulard Plehn Co.	.1396c
Birmingham & Prosser Co.	.141c
Mathers-Lamm Paper Co.	.1397c
Old Dominion Paper Co.	.14124c
Whitaker Paper Co.	.1334c
Mudge Paper Co.	.1414c
Paper Corp. of U. S.	.1372c
Howard Paper Mills (Aetna Div.)	.1348c

25% Ledger, White and Colored

No. 154—20,000 lbs., white, No. 48; flat, cut 28x34, 32x42, 34x44, and 38x48 ins. Min. order, 5,000 lbs.

Stanford Paper Co.	.1678c
Barton, Duer & Koch Paper Co.	.16c
Butler Co.	.15589c
Paper Corp. of U. S.	.187c
Baxter Paper Co.	.1598c
Howard Paper Mills (Aetna Div.)	.1583c

No. 155—100,000 lbs., white, No. 64; flat, cut 28x34, 32x42, 34x44 and 38x48 ins. Min. order, 5,000 lbs.

Walker Goulard Plehn Co.	.1648c
Barton, Duer & Koch Paper Co.	.16c
Whitaker Paper Co.	.1621c
Paper Corp. of U. S.	.187c
Baxter Paper Co.	.1573c
John W. McNeil, Inc.	.15489c
Howard Paper Mills (Aetna Div.)	.1583c

No. 156—100,000 lbs., white, No. 88. Flat, cut 28x34, 32x42, 34x44 and 38x48 ins. Min. order, 5,000 lbs.

Stanford Paper Co.	.1662c
Barton, Duer & Koch Paper Co.	.16c
Paper Corp. of U. S.	.183c
Baxter Paper Co.	.1588c
Howard Paper Mills (Aetna Div.)	.1583c

No. 157—50,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 64. Flat, cut 34x44 ins. Min. order, one color, 5,000 lbs.

Birmingham & Prosser Co.	.16439c
Barton, Duer & Koch Paper Co.	.1625c
Paper Corp. of U. S.	.193c
Howard Paper Mills (Aetna Div.)	.1653c

100% White Ledger

No. 178—10,000 lbs., No. 88. Flat, cut 22¾x31 and 34x44 ins. Min. order, 5,000 lbs.

Bulkley Dunton & Co.	.355c
R. P. Andrews Paper Co.	.3522c
Barton, Duer & Koch Paper Co.	.29c

Chemical Wood, White and Colored Index

No. 182—250,000 lbs., white, 25½x30½—220; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

Walker Goulard Plehn Co.	.1114c
Birmingham & Prosser Co.	.1375c
Mathers-Lamm Paper Co.	.1362c
Old Dominion Paper Co.	.13772c
Whitaker Paper Co.	.1081c
Mudge Paper Co.	.1378c

No. 185—40,000 lbs., buff, single-ply; 25½x30½—220. Flat, cut 32x42 ins. with projecting colored-paper marker between each 100 sheets.

Walker Goulard Plehn Co.	.1165c
Birmingham & Prosser Co.	.145c
Mathers-Lamm Paper Co.	.1437c
Old Dominion Paper Co.	.14529c
Mudge Paper Co.	.1454c

50% Index, White and Colored

No. 188—200,000 lbs., white, 25½x30½—220; flat, cut 32x42, and 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

Walker Goulard Plehn Co.	.165c
Birmingham & Prosser Co.	.1815c
Bulkley Dunton & Co.	.2053c
R. P. Andrews Paper Co.	.1725c
Mathers-Lamm Paper Co.	.1795c
Barton, Duer & Koch Paper Co.	.1637c
Old Dominion Paper Co.	.181519c
Whitaker Paper Co.	.22c
Mudge Paper Co.	.1816c
Paper Corp. of U. S.	.1932c
Howard Paper Mills (Aetna Div.)	.1629c

No. 191—80,000 lbs., blue, buff, cherry, fawn, green, pink, salmon, and yellow; 25½x30½—220; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, 5,000 lbs.

Walker Goulard Plehn Co. (Minimum order 10,000 lbs.)	.176c
Birmingham & Prosser Co.	.22c
R. P. Andrews Paper Co.	.175c
Mathers-Lamm Paper Co.	.2172c
Barton, Duer & Koch Paper Co. (Minimum order 10,000 lbs.)	.1687c
Old Dominion Paper Co.	.21944c
Mudge Paper Co.	.2196c
Howard Paper Mills (Aetna Div.)	.1704c

100% White Index

No. 196—40,000 lbs., 25½x30½—250; flat, cut 20¼x30 ins.

Walker Goulard Plehn Co.	.295c
R. P. Andrews Paper Co.	.3498c
Barton, Duer & Koch Paper Co.	.2795c
Paper Corp. of U. S.	.309c
Frank Parsons Paper Co.	.386c

Antique-Finish Cover, White and Colored

No. 202—40,000 lbs., white, 20x26—100. Flat, cut 25¼x39 ins., with projecting colored-paper marker between each 500 sheets.

Walker Goulard Plehn Co.	.141c
R. P. Andrews Paper Co.	.1287c
Old Dominion Paper Co.	.13568c
Whitaker Paper Co.	.1285c
Paper Corp. of U. S.	.1141c

No. 203—65,000 lbs., 20x26—100; blue, buff, dawn, quaker, drab, terra cotta, gray, brown, green, gobelin blue, granite, tea, and yellow; flat, cut 25¼x39 ins., with projecting colored-paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.

Birmingham & Prosser Co.	.134c
R. P. Andrews Paper Co.	.1287c
Mathers-Lamm Paper Co.	.1325c
Old Dominion Paper Co.	.13419c
Whitaker Paper Co.	.144c
Mudge Paper Co.	.1343c

50% Laid Cover, Colored

No. 206—45,000 lbs., blue, cream, white, gray, and green; 20x26—130; flat, cut 25¼x39 and 28x41 ins., with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,000 lbs.

R. P. Andrews Paper Co.	.1908c
Paper Corp. of U. S.	.1874c

Wood Manila

No. 208—80,000 lbs., 24x36—80; flat, cut 25x38 and 32x42 ins., with projecting colored-paper marker between each 500 sheets.

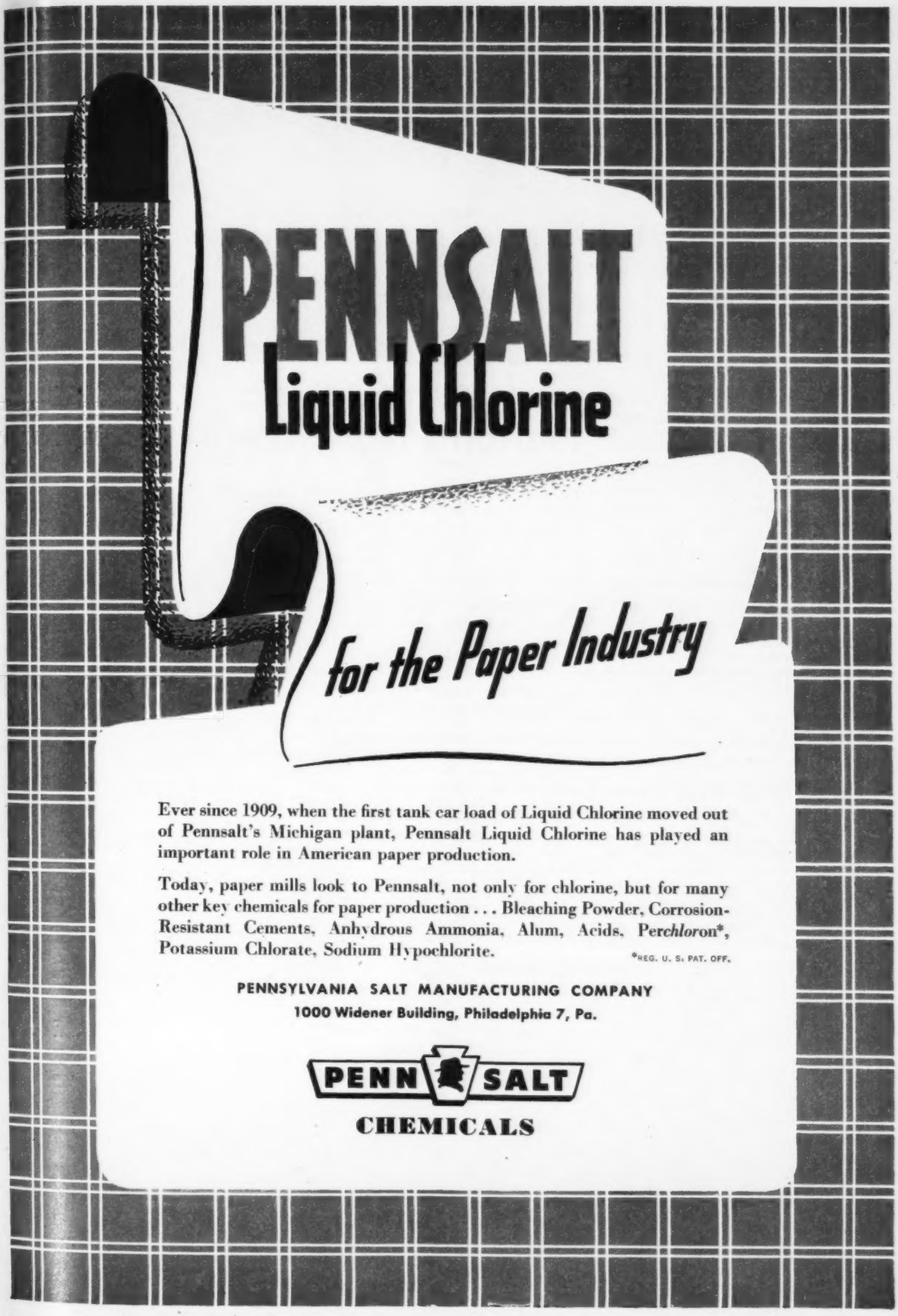
Walker Goulard Plehn Co.	.0838c
Frank Parsons Paper Co.	.0928c

Drumhead Manila

No. 217—5,000 lbs., 24x36—280. Flat, cut 32x42 ins. Min. order, 5,000 lbs.

Walker Goulard Plehn Co.	.145c
Paper Corp. of U. S.	.4289c

(Continued on page 20)



Ever since 1909, when the first tank car load of Liquid Chlorine moved out of Pennsalt's Michigan plant, Pennsalt Liquid Chlorine has played an important role in American paper production.

Today, paper mills look to Pennsalt, not only for chlorine, but for many other key chemicals for paper production . . . Bleaching Powder, Corrosion-Resistant Cements, Anhydrous Ammonia, Alum, Acids, Per*chloron**, Potassium Chlorate, Sodium Hypochlorite.

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1000 Widener Building, Philadelphia 7, Pa.

PENN SALT
CHEMICALS

GPO Bids

(Continued from page 18)

No. 2 Kraft

No. 218—40,000 lbs., 24x36—80 to 160; flat, cut any size in wrapped bundles.

Cauthorne Paper Co. (120 or 140 lb. basis.)	.11c
Frederick G. Marks Co.	.085c

White Gummed

No. 252—200,000 sheets, No. 40; flat, cut 22x34 ins. Min. order, 25,000 sheets.

Bulkley Dunton & Co., (per M sheets.)	$22.92
R. P. Andrews Paper Co. (per M sheets.)	$21.92
Stanford Paper Co. (per M sheets.)	$21.89
Butler Co. (per M sheets.)	$24.54
Old Dominion Paper Co. (per M sheets.)	$23.998
Whitaker Paper Co. (per M sheets.)	$21.50
Mudge Paper Co. (per M sheets.)	$24.98
Paper Corp. of U. S. (per M sheets.)	$24.30

High-Finish Chemical Wood Manila Tag

No. 271—80,000 lbs., 24x26—280. Flat, cut any size, min. width 24 ins., max. width 38 ins.

Birmingham & Prosser Co.	.113c
R. P. Andrews Paper Co.	.1175c
Mathers-Lamm Paper Co.	.1117c
Old Dominion Paper Co.	.11299c
Mudge Paper Co.	.1131c
Paper Corp. of U. S.	.1323c

Railroad Board, White and Colored

No. 302—15,000 lbs., white, flat, 22x34 ins., 8-ply, each 100 sheets fully banded. Min. order, 5,000 sheets.

Bulkley Dunton & Co.	$77.979
Stanford Paper Co.	$78.34
Barton, Duer & Koch Paper Co.	$79.45
Old Dominion Paper Co.	$78.488

No. 303—10,000 lbs., white, flat, 22x34 ins., 14-ply, each 50 sheets fully banded. Min. order, 5,000 sheets.

Bulkley Dunton & Co.	$104.753
Stanford Paper Co.	$106.23
Barton, Duer & Koch Paper Co.	$108.68
Old Dominion Paper Co.	$106.488

Wood Cardboard, Colored

No. 306—80,000 lbs., buff, 22½x28½—150; rolls, 20 ins. wide (3-inch fiber cores).

Walker Goulard Plehn Co.	.1016c
Barton, Duer & Koch Paper Co.	.1185c

No. 307—100,000 lbs., buff, 22½x28½—150; flat, cut 32x42 ins.

Walker Goulard Plehn Co.	.1121c
Barton, Duer & Koch Paper Co.	.131c

No. 308—20,000 lbs., melon; 22½x28½—184. Flat, cut 20x30 ins., in wrapped bundles with projecting colored-paper marker between each 100 sheets.

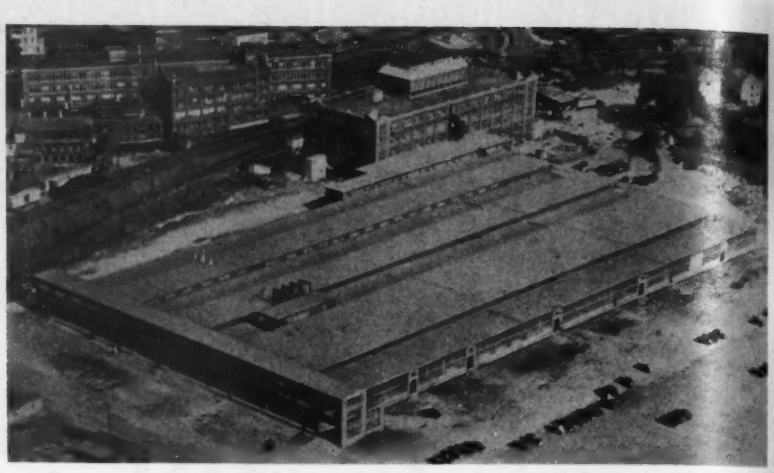
No. 309—50,000 lbs., blue, buff, gray, green, melon, pink, and yellow; 22½x28½—184. Rolls, 20 ins. wide (3-inch fiber cores).

Walker Goulard Plehn Co.	.1167c

United States Postal Card Paper

No. 325—3,000,000 lbs., 22½x28½—188; rolls, 33 ins. wide, 36 ins. in diameter (6-inch iron or metal capped returnable fiber cores).

Walker Goulard Plehn Co. (1,000,000 lbs. only.)	.116c
Birmingham & Prosser Co. (800,000 lbs. only.)	.1098c
Bulkley Dunton & Co. (400,000 lbs. only.)	.10885c
R. P. Andrews Paper Co. (1,400,000 lbs. only.)	.0823c
Mathers-Lamm Paper Co. (600,000 lbs. only.)	.1087c
Old Dominion Paper Co. (200,000 lbs. only.)	.10988c
Mead Sales Co. (400,000 lbs. only.)	.101c
Whitaker Paper Co.	.0879c
Mudge Paper Co. (500,000 lbs. only.)	.1099c



Airplane view of the Norton Co., Plant 7. The plant has approximately five acres of floor space and it is said to be largest building in the world for the production of grinding wheels.

Norton Plant "World's Largest"

WORCESTER, Mass.—The Norton Co., dedicated a $4,300,000 manufacturing plant in a private ceremony August 30.

The building was especially designed and constructed to house a special process of grinding wheel manufacture which enables wheels to be made to new standards of precision in dimensions and balance with a degree of uniformity previously considered impossible in a vitrified product, it is stated.

George N. Jeppson, chairman of the board of Norton Company, who started this development and participated in the inventions involved, delivered the opening dedicatory address on the subject of "A Vision Becomes a Reality." He then turned the new plant over to Milton P. Higgins, president. Mr. Higgins gave the dedication address. Other speakers were Ralph F. Gow, executive vice president and Wallace T. Montague, vice-president. Andrew B. Holmstrom, vice-president and general manager of the abrasive division, was chairman of the program and introduced the speakers.

John Jeppson, son of the chairman of the board and superintendent of the new plant, pointed out that more than 10,000,000 grinding wheels have already been made by the new process, first in the pilot plant and for the past few months in the new building. He stated that many customers, especially in the field of internal grinding, have been using the wheels and that their reports have established the soundness of the new process in grinding wheel manufacture. Users of the new wheels, he said, not only have attested to the better production obtained from them but also were pleased with the improved service that was first made possible on small wheels through operation of the pilot plant and now is obtainable on larger wheels through production in the new plant.

No. 327—200,000 lbs., 22½x28½—188. Rolls, 22 ins. wide, 36 inches diameter (6-inch iron or metal capped returnable fiber cores).

Walker Goulard Plehn Co.	.116c
Birmingham & Prosser Co.	.0997c
Bulkley Dunton & Co.	.0989c
R. P. Andrews Paper Co.	.0823c
Mathers-Lamm Paper Co.	.0987c
Old Dominion Paper Co.	.099889c
Whitaker Paper Co.	.0879c
Mudge Paper Co.	.0999c

Pressboard, Colored

No. 351—15,000 lbs., red. Flat, cut 30x36 ins., thickness .0140 inch. Min. order, 5,000 sheets.

R. P. Andrews Paper Co. (per C sheets.)	$15.34

No. 352—15,000 lbs., flat, cut 30x36 ins., thickness .0300 inch. Min. order, 5,000 sheets.

R. P. Andrews Paper Co. (per C sheets.)	$34.44

Newsboard

No. 360—100,000 lbs., 26x38; No. 100; flat, cut any size, min. 21x32 ins., max. 40x52½ ins. (To be trimmed square on four sides).

Bulkley Dunton & Co.	.0496c
R. P. Andrews Paper Co.	.043c
Mathers-Lamm Paper Co.	.040275c
Whitaker Paper Co.	.04375c
Paper Corp. of U. S.	.04462c

Binder's Board, No. 1 Quality.

No. 366—40,000 lbs., No. 1. 25¾x30¾ ins., Nos. 16, 18, 20, 25, 30, and 40; flat, to trim 25x30 ins.

Consolidated Paper Co. (per T for 10 tons.)	$148.25
(per T—5 to 10 tons.)	$153.
(per T—1 to 5 tons.—plus $5.00 per ton for boards .049, plus $2.50 per ton for .040 to .158, plus $4.00 for boards .141 and up.)	$165.
R. P. Andrews Paper Co.	$ .059
Barton, Duer & Koch Paper Co.	$ .058
Whitaker Paper Co. (Minimum order 36,000 lbs.)	$ .0587

No. 367—40,000 lbs., No. 1. 25¾x30¾ ins., Nos. 12 and 20; flat, to trim 34x44 ins.

Consolidated Paper Co. (per T for 10 tons.)	$148.25
(per T—5 to 10 tons.)	$153.
(per T—1 to 5 tons.—plus $5.00 per ton for boards .049, plus $2.50 per ton for .040 to .158, plus $4.00 for boards .141 and up.)	$165.

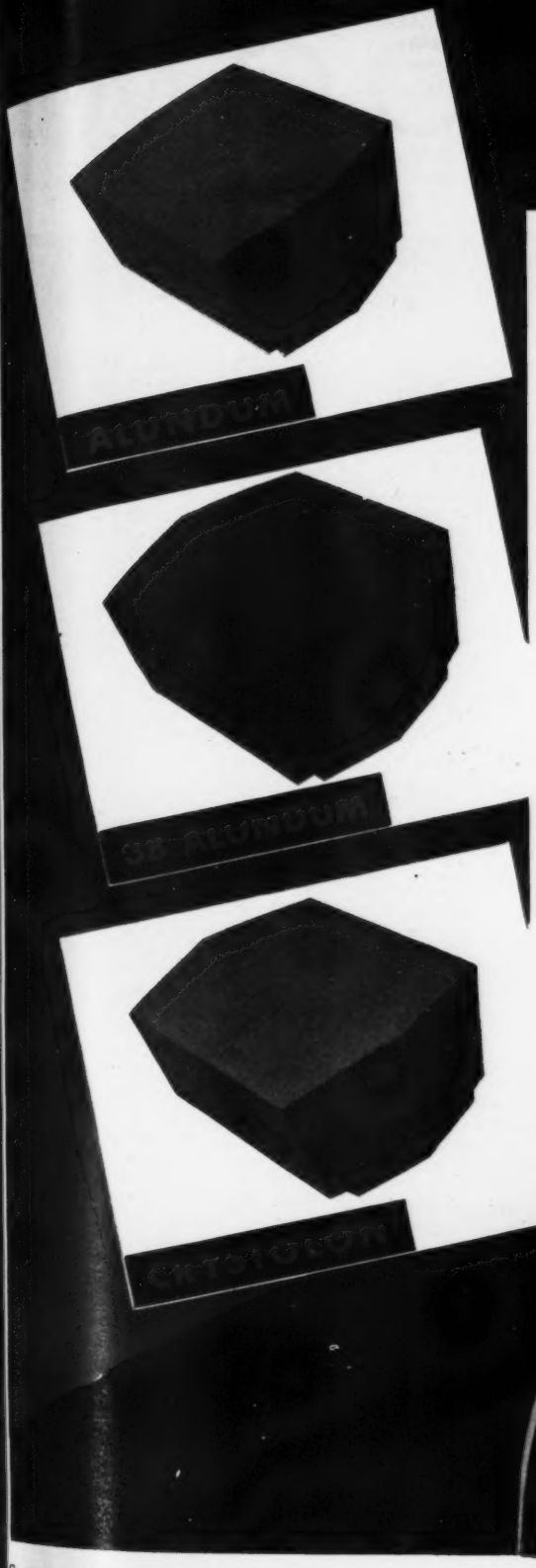
Chestnut Cover Board

No. 369—20,000 lbs., 25¾x30¾; flat, to trim 25x30 inches, Nos. 17, 19, 21, 25, 31, and 41.

No. 370—70,000 lbs., 25¾x30¾; Nos. 16, 19, 24, and 31. Flat, to trim 25¾x37¾ ins.

Norton Has the Right Kind of Abrasive

To Produce Your Kind of Pulp



YES, every Norton Pulpstone is individually engineered to produce just the type of pulp that you require—and this engineering starts with the selection of the right abrasive. Whether it will be ALUNDUM, 38 ALUNDUM, or CRYSTOLON abrasive depends on the kind of wood you are grinding and the type of equipment you are using.

ALUNDUM abrasive is an aluminum oxide product —made by fusing the mineral, bauxite in arc-type electric furnaces at 3700° F. Its hard, tough grains produce a high quality pulp.

38 ALUNDUM abrasive is also an aluminum oxide product but with somewhat different chemical and physical properties which make it especially suitable for producing certain types of pulp.

CRYSTOLON abrasive is a silicon carbide product made by fusing metallurgical coke and silica sand in resistance-type electric furnaces. Its characteristics of hardness and sharpness have made CRYSTOLON stones well known for many years as high producers of quality pulp.

You can be sure that Norton can furnish just the right stone for every grinder in your mill.

NORTON COMPANY, WORCESTER 6, MASS.
NORTON COMPANY OF CANADA, LTD., HAMILTON, ONTARIO

NORTON ABRASIVES

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, September 15, 1948.

Wood Pulp

A general drop in Swedish chemical wood pulp prices of $15 to $20 per short air-dry ton followed the Swedish Government's removal of the so-called "export tax" which amounted to $12.50. Earlier news of bleached sulphate and bleached sulphite at $165 and kraft at $127.50 have been followed by a $140 price for unbleached sulphite, prices varying somewhat according to grades and mills.

With no "export tax" included in the Finnish prices, reduced prices present a different problem to the producers; they would have to absorb the entire change in price. No decision had been announced at the time of going to press.

Neither have all Canadian and U.S. pulp producers announced fourth quarter prices. It appears that third-quarter levels will be maintained on most grades, however. Several Canadian mills have given notice of a $10 per ton drop in kraft prices.

U. S. consuming mills find this heartening news, particularly those non-integrated mills which were forced to cut back production rather than attempt to buy Scandinavian high prices pulp with which to meet integrated mill competition. It is not expected, however, that a rush in buying will follow the announcements of price reductions. Inventories at all mills are reported at good levels with minimum portions of Scandinavian pulp affected by the lowered prices. It is believed that a gradual renewal of buying will develop.

Waste Paper

Prices for pulp substitute grades dipped with prices of Scandinavian pulp and are reported at $10 to $15 a ton lower. Slow trading in the New York area was held to a low by the truckmen's strike.

Eastern Conservation Committee reports that old containers, in short supply a year ago, are most plentiful of the waste paper grades, though the mills on the whole are using and buying more of the container grades than ever before. High grades are plentiful, mill inventories of such being greater than a year ago and more than double those of two years ago. Board mills are using less of mixed grades than a year ago. There has been plenty available and not a great deal of warehouse space taken up with inventories.

News consumption last year increased between 20 and 25 percent over 1946 and has been holding its own during the first 36 weeks of 1948. Supplies have fallen off during the summer and mill inventories are now well below those of last year, although still much higher than two years ago. Collections of old newspapers during this month should largely determine the amount of extra activity that will have to be expended by dealers during the final quarter, Mr. Colley S. Baker of ECC believes. Some have felt *news* grades have been drying up, others feel the resumption of fall activity of peddlers and the increase of newspapers will adequately supply the market.

Newsprint

Following the lead of Publisher Arthur Hays Sulzberger of the *New York Times*, the majority of N. Y. newspaper publishers were reported by the ANPA as being willing to allocate a portion of their newsprint supplies to British newspapers to ease the threat which an uninformed public poses to the democratic way of life. British newspaper circles, while applauding the offer as generous, believe there is little chance of their Government's being able to grant dollars for such purchase.

Britain's 1949 program for newsprint imports has been drafted, however, and reports are that an increased supply looks possible, Canada and Newfoundland being the chief suppliers. This program must have approval of ECA, it is stated, since purchases will be financed by the aid program. A leading British trade journal says that the attitude of the British Government has been made perfectly plain about such purchases. "It is that dollar expenditure on newsprint should be kept to a minimum even though it may be covered in whole or in part by ERP."

The drafted 1949 program will probably come up for discussion during the current meetings of the ECA Pulp and Paper group in Paris. In the absence of official ECA releases on the group's proposals, it is believed that action will not be taken without Washington approval.

British newsprint weekly production increased in the second quarter of 1948 to 4,531 tons or 29.3 percent of the pre-war average of 15,400 tons weekly.

Shortage of dollars is reported as explaining the recent British stand that the Board of Trade would not facilitate the purchase of 60,000 cords of pulpwood from Newfoundland for the manufacture of newsprint, reported by ANPA.

British Labor Member of Parliament, Capt. Julian Snow, suggested that the British supply of newsprint be rationed "so that all reasonable politican opinions of all shades and colors should have equal opportunity of presentation to the public." Capt. Snow stated that the spirit of democracy would be better served if some way of rationing newsprint to the public were devised.

Russia offered to barter newsprint to Australia in exchange for manufactured goods, according to report from Canberra released by the Soviet commercial attache.

Indexes

Index of general business activity for the week ended September 4 dipped to 147.4 from 148.3 in the preceding week, compared with 140.8 for the corresponding week of 1947.

Index of paperboard production declined to 170.0 from 175.0 in the preceding week, compared with 162.7 in the corresponding week of 1947.

Comparative ratios of U. S. paper and paperboard production to mill capacity as reported by AP&PA are shown below:

	Sept. 4 1948	Aug. 28 1948	Sept. 6 1947	Sept. 7 1946	Sept. 8 1945
Paper**	94.8	†95.2	84.7	86.7	75.9
Paperboard	91.0	93.0	79.0	83.0	80.0

** Indicates 1948 volume of 169,676 tons. Comparable week 1947, 134,235 tons.
† Revised.

Paperboard Production (Tons)

	Sept. 4 1948	Aug. 28 1948	Sept. 6 1947
Production	182,685	183,835	139,886
New Orders	234,396	166,039	196,986
Unfilled Orders	392,753	344,469	478,283

Percent of Activity, Current	91%
Percent of Activity, Year to Date	97%

Swedish Export Tax

NEW YORK — The Swedish government on Sept. 10 announced the decision to remove the "business cycle equalization charge" of 50 Swedish kronor levied on each ton of chemical wood pulp exported. This charge had been strongly protested by U. S. pulp consumers on the basis that it was an export tax and as such was inconsistent with Marshall Plan principles.

Mr. Karl A. Clauson, Executive Secy. of the Ass'n. of Pulp Consumers, Inc., greeted this announcement as a constructive move that will lead to a gradual resumption of imports of Swedish wood pulp. U. S. pulp consumers normally purchase 1,200,000 tons of pulp from domestic sources, 800,000 tons from Canada, and 750,000 from Scandinavia. Mr. Clauson stated that, even with wood pulp in relatively short supply, it had become economically impossible to buy European pulp as the sales price of the finished paper is based on pulp at domestic price levels and European had been offered in the American market at $20 to $60 per ton above domestic prices.

With the removal of the tax, it is anticipated the European price differential will be partially reduced and that an orderly adjustment of European price levels will follow. Sweden will benefit by the inflow of sorely needed dollars.

Paperboard Prices

WASHINGTON—A further decline in paperboard prices between August 28 and September 4 was noted by the Bureau of Labor Statistics on September 9. The report noted a drop of 0.1 percent in prices of paper and pulp for the period under review.

SMOOTHNESS

The texture of *Wyandotte Precipitated Calcium Carbonate* is another "picture of smoothness."

This highly refined paper-coating pigment is unequaled in freedom from grit and abrasiveness . . . in hiding power and ink absorption . . . in that uniformity which is so essential to machine coating.

Its superiority is the result of Wyandotte's extensive research and long experience in the field. For years, Wyandotte has made a *business* of supplying paper manufacturers with this truly fine pigment.

Why not write today for complete information on Wyandotte Precipitated Calcium Carbonate?

WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN • OFFICES IN PRINCIPAL CITIES

Soda Ash • Caustic Soda • Bicarbonate of Soda • Calcium Carbonate • Calcium Chloride • Chlorine • Hydrogen • Dry Ice • Glycols
Ethylene Dichloride • Propylene Dichloride • Chloroethers • Aromatic Sulfonic Acid Derivatives • Other Organic and Inorganic Chemicals

Wyandotte
REG. U. S. PAT. OFF.

IMPORTS

Week Ended September 11

NEW YORK

Newsprint

H. G. Craig Co., Kermic, Donnacona, 340 rolls.
R. A. Olsen, Newscarrier, Donnacona, 388 rolls.
News Syndicate Co., Ogna, Rouen, 225 rolls.
R. A. Olsen, Donpaco, Donnacona, 422 rolls.
News Syndicate Co., Colabee, Baie Comeau, 7734 rolls.
R. A. Olsen, G. T. D., Donnacona, 368 rolls.
H. G. Craig Co., Newscarrier, Donnacona, 374 rolls.

Wallpaper

Lehman Trading Corp., Mormacmail, Stockholm, 1 cs.

Marbled Paper

Tamm & Co., Mormacmail, Stockholm, 1 cs.

Wrapping Paper

Jay Madden Corp., Mormacmail, Helsingfors, 186 rolls.
Manufacturers Trust Co., Gripsholm, Gothenburg, 33 rolls.
National City Bank, Gripsholm, Gothenburg, 5 rolls.
Corn Exchange Bank, Gripsholm, Gothenburg, 31 rolls.
American Express Co., Gripsholm, Gothenburg, 241 rolls.
Bank of The Manhattan Co., Gripsholm, Gothenburg, 81 rolls.

Serviettes

H. W. Robinson Co., American Flyer, London, 9 cs.

Filter Paper

H. Reeve Angel, American Flyer, London, 7 cs.

Drawing Paper

Natural Nydegger Transport Co., Amsteldyk, Rotterdam, 1 cs.

Emery Paper

Gondrand Bros., America, Havre, 3 cs.

Photo Paper

J. J. Gavin Co., Queen Elizabeth, Southampton, 2 cs.

Wallboard

Elof Hansson, Inc., Gripsholm, Gothenburg, 1 cs., 1 bdl.

Miscellaneous Paper

S. H. Pomerance, Gripsholm, Gothenburg, 1 cs.
William Uslan & Son, Gripsholm, Gothenburg, 15 rolls, (sulphite).
Elof Hansson Inc., Gripsholm, Gothenburg, 3 rolls (sulphite, samples).

Rags, Baggings, Etc.

New England Waste Co., Kirsten, Santos, 408 bls. old jute waste bagging.
National City Bank, City of Calcutta, Calcutta, 15 bls. jute twine rag cuttings.
(———) City of Calcutta, Calcutta, 28 bls. burlap cutitngs.
Manufacturers Trust Co., American Forwarder, Manchester, 5 bls. wool rags.
Chase National Bank, American Forwarder, 18 bls. wool rags, 135 bls. jute waste.
Irving Trust Co., American Forwarder, Manchester, 78 bls. jute waste.
Leigh Textile Co., American Forwarder, Manchester, 20 bls. cotton waste.
(———), American Forwarder, Manchester, 91 bls. cotton rags.
(———), Exchester, Genoa, 138 bls. hemp rags.
H. Adlerstein, Exchester, Genoa, 203 bls. old jute rags.
(———), Kong Haakon, Alexandria, 123 bls. rags.
National City Bank, Kong Haakon, Alexandria, 36 bls. old light hessians, 46 bls. heavy jute bagging.
(———), Laura Maersk, Shanghai, 200 bls. cotton waste.

Old Rope

National City Bank, City of Calcutta, Calcutta, 65 bls. old hemp rope cuttings.
(———), City of Calcutta, Calcutta, 95 bls. old hemp rope cuttings.

Gluestock

1st National Bank of Boston, Santa Olivia, Mollendo, 209 pkgs.

Woodpulp

Atlantic Forwarding Co., Gripsholm, Gothenburg, 1 pkge. woodpulp (samples).

Woodpulp Boards

Jay Madden Corp., Mormacmail, Helsingfors, 311 rolls (solid white).

Casein

East Asiatic Co., Kirsten, Buenos Aires, 500 bags (lactic).
American Cyanamid Co., Uruguay, Buenos Aires, 3100 bags.
T. J. Kane & Co., Uruguay, Buenos Aires, 2000 bags.

BOSTON

F. H. Paul & Stein Bros., Kirsten, Buenos Aires, 1000 bags casein.
Green Textile Associates, Kirsten, Santos, 72 bls. cotton waste.

PHILADELPHIA

Pulp Sales Corp., Mormacmail, Helsingfors, 254 bls. white dry mechanically ground woodpulp.
Jay Madden Corp., Mormacmail, Helsingfors, 365 rolls wrapping paper.
Leigh Textile Co., American Forwarder, Manchester, 43 bls. old gunny bagging.
Castle & Overton, Inc., American Forwarder, Glasgow, 122 bls. jute thread waste.

BALTIMORE

Green Kriegsman Paper Co., Mormacmail, Gothenburg, 285 rolls paper.

NORFOLK

F. P. Gaskell Co., American Forwarder, Glasgow, 100 cs. coated paper (for cigarette tips).
Castle & Overton, Inc., American Forwarder, Glasgow, 1500 bls. heavy jute bagging.

SAN FRANCISCO

American Express Co., Exchester, Catania, 58 bls. old dark cotton rags.

Mexican Chemical Production

WASHINGTON—Soda ash and caustic soda production are scheduled to reach totals of 30,000 and 12,000 metric tons respectively this year at Mexico's new plant, Soso-Texcoco, S.A., according to a report to this government released last week. It was added that while these are the scheduled goals, caustic soda production may not exceed 10,000 tons, although the increased output of soda ash may be realized.

Predicts Lower Corn Prices

CLINTON, Iowa.—Prospects for lower prices for products manufactured from corn will be excellent in the coming year because a record corn crop is practically assured, R. E. Clizbe, president and general manager of Clinton Industries, Inc., said on September 13.

"With the bumper corn crop, estimated by the Dept. of Agriculture at more than three and a half billion bushels, there is no question but that corn prices will be materially reduced," Mr. Clizbe said. "The end result should be lower prices to the consumer for products manufactured from corn."

A Clinton subsidiary is the American Partition Co., maker of industrial packaging material.

Czech Production

Production of chemical pulp from hardwoods will be undertaken for the first time in Czechslovakia by a new sawmill to be established at Vranov in eastern Slovakia, reports the *Foreign Commerce Weekly*. If successful, the additional pulp output will benefit the pulp and paper industry now said to be suffering from a severe shortage of pine and fir.

Production of the paper industry in Czechslovakia during the first four months of 1948, with the percentage of planned production during the period in parentheses, was given as: chemical pulp, 82,987 metric tons (101 percent); paper, 91,512 (113.4 percent); paperboard, 25,834 (113.8 percent).

Austrian Paper Exports

WASHINGTON—Paper exports to the United States from Austria amounted to $251,600, or approximately 5.7 percent of the value of all Austrian shipments to this market, during 1947, according to figures just reported to this Government covering the year.

Austria's paper exports to all countries, including the amount shipped to the United States, amounted to $7,379,700 during the year. Woodpulp shipments valued at $1,340,100, of which pulp valued at $222,100 was exported to the United States.

Austrian production of industrial wood including pulpwood, for the year ending with March, was to have been 4,328,100 cubic meters, which at the time of the report, included 613,000 cubic meters of pulpwood.

Avers Sweden Near Limit

PORTLAND, Ore. — Dr. Holger Erdtman, professor of organic chemistry at the Royal Institute of Technology, Stockholm, Sweden, attending the third annual seminar of TAPPI at the Multnomah Hotel, September 2-3, said that Sweden cannot replenish America's diminishing wood pulp supply because she has reached her production limit.

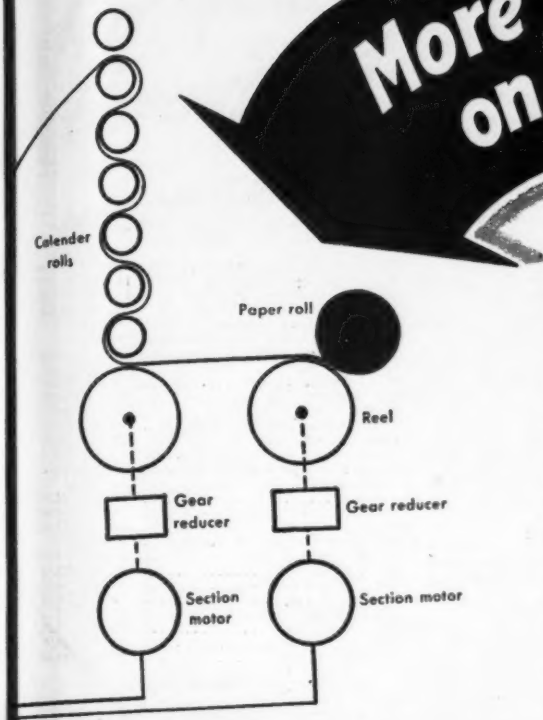
Dr. Erdtman was accompanied by his wife, who is working for the Swedish Wood Research Institute.

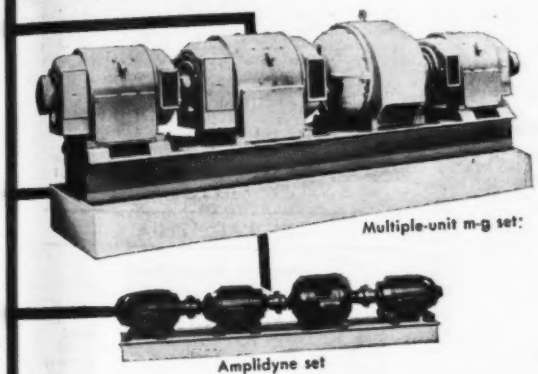
Both Dr. Erdtman and Mrs. Erdtman are scheduled to lecture at the coming convention of the American Chemical Society.

Italian Paper Trade

WASHINGTON — Italian paper and paper products importations totaled 201,627 metric tons, valued at $41,000 in 1947, according to figures reported here through official channels for the year. Exports amounted to 11,977 tons valued at approximately $6,500. Details of the trade were not reported.

More output on the reel!





G-E multiple-generator sectional drive accurately holds draw between sections regardless of load changes—helps you get higher speeds, reduced broke, more "bull's-eyes" on the reel.

With the G-E multiple-generator sectional drive, the over-all speed of your paper machine is easily adjusted from a central point at the master control panel. Breaks, slack, or weaving at the reel are reduced to a minimum because the precision and speed-of-response of the electronic-amplidyne system accurately holds draw *regardless of load changes.*

Basically, this drive is simpler than the common generator system—easier to operate and understand. The starting generator and its complicated switching are eliminated. Slack take-up for each section (except the couch) is provided from a simple push-button control. All guesswork is eliminated from draw adjustment because section speeds respond immediately and accurately. Tension control—pioneered by General Electric—prevents the accumulation of excess tension on the calender and reel sections.

A new bulletin has been prepared describing this modern development in sectional paper-mill drives. Write today for Bulletin GEA-5036. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

We at General Electric are proud of our part in your growth. Step by step, we have kept pace with your demands for more efficiency by pioneering with you in the improvement of paper-machine drives. Here reproduced, for example, are a few G-E "firsts" that have met early and recent needs of the paper industry.

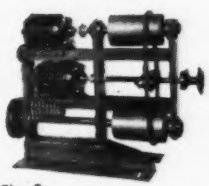


Fig. 2

In 1920 G.E. developed the first successful speed regulator for sectional paper-machine drives (Fig. 1). Of the synchronous dynamometer type, it superseded the G-E sectional drive of 1909 which used mechanical speed changers for draw. Then came the selsyn regulator (Fig. 2) in 1928, the same year when G.E. began experimenting on electronic speed regulators. Finally there is the modern electronic-amplidyne type of regulator (Fig. 3) which, together with the multiple-generator system, has demonstrated its remarkable performance since 1946.

To meet your future needs as we have in the past, G.E. will continue to develop and produce the finest in electric equipment for the paper industry.

Fig. 3

GENERAL ELECTRIC

PRICES

Quotations indicate trends in an open market. At the moment they can be of little more value. While some volume business still is done under contract at the figures shown, fluctuations are too varied and frequent to permit prices to be interpreted as representing a wholly stabilized market.

NEW YORK

Paper

(Delivered New York)

Standard News, per ton—	
Rolls, contract	$96.00/100.00
Sheets	111.00/ —
Kraft—per cwt.—Carload Quantities Zone A Deld. 40 lb. base wgt.	
Superstandard Wrapping	$9.00/ —
No. 1 Wrapping	7.25/ 8.00
Standard Wrapping	7.00/ —
Standard Bag	6.50/ —
Tissues—Per Ream 24x36 (480) 11 lbs. Zone 1.	
Wh. No. 1 Frd.	$1.84/$2.00
Wh. No. 1 M. G.	1.94/ 2.00
Wh. No. 1½	1.60/ —
Wh. No. 2	1.75/ —
Kraft Anti-Tar	1.65/ —
Kraft Unbl.	1.85/ —
Manila No. 2	1.62/ —
Shred. Wh. No. 1 cwt.	1.10/ 1.50
Toilet—Per Case of 100 rolls—1 M Sheets.	
Unbleached	$8.50/$10.00
Bleached	8.50/ 10.00
Paper Towels—Per Case of 3750—Zone 1.	
Wh. Jr. M'tif'd 9¼x9½	$5.15
Br. Sr. M'tif'd 10x12	3.60
Br. Jr. M'tif'd 9½x9¾	3.10
Br. Jr. Sgl. fold 10x10¾	3.15
Manila—per cwt.—C-1 f.a.	
No. 1 Jute Tag	$14.50/ —
Reg. Jute Manila	13.25/$15.50
No. 1 Manila	9.75/ —
5 lb. Manila	10.75/ 11.25
Boards, per ton—	
Filled News	94.00/ —
Plain Chip	90.00/ —
Blchd. Mla. L-d. Chip*	105.00/ —
White Pat. coated*	120.00/ —
Kraft Liners 42 lb.	105.00/ —
Kraft Corr. .009	110.00/ —
Binders Boards	126.00/ —

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—
White, 16 lb.
Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$59.00	$54.55	$52.30
100% Rag	52.25	48.30	46.30
75% Rag	40.00	37.05	35.50
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Ledgers, per cwt.

100% Rag Ext. No. 1	$57.00	$52.65	$50.50
100% Rag	50.25	46.40	44.50
75% Rag	40.00	37.05	35.50
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Sulphite Bonds and Ledgers—
White, 16 lbs.

Bonds, per cwt.

No. 1	$21.25	$19.25	$18.50
No. 2	20.25	18.30	17.55
No. 4	19.25	17.55	16.85

Ledgers, per cwt.

No. 1	$21.75	$19.65	$18.85
No. 2	20.75	18.75	18.05
No. 4	20.00	18.10	17.35

Free Sheet Book Papers—
White, Cased Paper

	(Per cwt.) Case	Ton
No. 1 Glossy Coated	$20.40	$19.50
No. 2 Glossy Coated	19.15	18.30
No. 3 Glossy Coated	18.40	17.60
No. 1 Antique (Watermarked)	15.90	15.15
No. 2 Offset	15.15 to 17.90	14.60 to 17.10
A Grade E. F.	14.90	14.25
A Grade S. & S. C.	15.40	14.65
B Grade E. F.	13.90	13.30
B Grade S. C.	14.40	13.70

Wood Pulp

Domestic mill contract prices delivered with varying freight allowances.

	Per Short ADT
Groundwood	$80.00/$81.00
Unbleached Sulphite	124.00/ —
Bleached Sulphite	125.00/135.00
Bleached Soda	130.00/ —
Bleached Sulphate	175.00/185.00
Unbleached Sulphate Northern	125.00/155.00
Unbleached Sulphate Southern	130.00/145.00

Canadian Quotations

Prices delivered with varying freight allowances unless otherwise specified:

	Per Short ADT
Bleached Sulphate	160.00/185.00
Unbleached Sulphate	125.00/150.00
Unbleached Sulphite	125.00/126.00
Bleached Sulphite	125.00/135.00
Glassine Unbleached Sulphite (no freight allowance)	120.00/ —
Bleached Soda	130.00/ —
Groundwood	80.00/ 85.00
Sideruns Pulping News	80.00/ 90.00
Hardwood and Specialty Grades	Nominal

Swedish Quotations

On dock, Atlantic Ports

Bleached Kraft	185.00/ —
Bleached Sulphite	185.00/ —
Unbleached Sulphite	155.00/157.50
Unbleached Kraft	147.50/ —

Finnish Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Sulphite	$187.50/ —
Unbleached Sulphite	155.00/157.00
Unbleached Sulphate	147.50/ —

Norwegian Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Sulphite	$165.00/$185.00

New Domestic Cotton Cuttings

(F.o.b. Ship. Pt. Plus Dealer's Commission)

White Shirt	$11.00/$11.50
Unbleached Muslin	11.50/ 12.00
Light Silesias	9.00/ 9.25
White Back Blue Overalls	9.00/ 9.50
Blue Overalls	8.00/ 8.25
Fancy Shirt	6.50/ 7.00
Light Percales	8.50/ 8.75
Light Prints	7.50/ 7.75
No. 1 Washables	5.00/ 5.25
Bleachable Khaki	7.00/ 7.50
Unbleachable Khaki	6.00/ 6.50
Cottonades	5.50/ 5.75

Old Domestic Cotton Rags

(F.o.b. Ship. Pt. Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$5.50/ $6.00
No. 1 Whites Miscellaneous	4.50/ 5.00
No. 2 Whites Repacked	3.50/ 3.75
No. 2 Whites Miscellaneous	3.00/ 3.50
Blue Overalls	3.75/ 4.00
Thirds and Blues Repacked	3.25/ 3.50
No. 1 Roofing Rags	1.70/ 1.80
No. 2 Roofing Rags	1.60/ 1.70
No. 3 Jute Bagging	1.50/ 1.60
No. 4 Brussels & b'd b'k crpts.	1.50/ 1.60
No. 5A Roofing Rags	1.50/ 1.60

New Foreign Cotton Cuttings

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
New Dark Cuttings	$5.50/ $5.75
New Mixed Cuttings	6.25/ 6.50
Light Silesias	9.25/ 9.50
Light Flannelettes	9.25/ 9.50
New White Cuttings	12.00/ 13.00
New Unbleached Cuttings	12.25/ 13.00
Fancy Shirt Cuttings	6.50/ 7.00
Light Prints	7.75/ 8.00
Bleachable Khaki, No. 1	7.00/ 7.50
Unbl. Khaki, No. 1	6.25/ 6.75

Old Foreign Rags

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
No. 1 White Cottons	8.00/ 10.00
No. 2 White Cottons	7.00/ 8.00
No. 3 White Cottons	6.00/ 6.50
No. 4 White Cottons	4.00/ 4.50
Extra Light Prints	6.50/ 7.00
Old Light Prints	4.50/ 5.00
Med. Light Prints	4.00/ 4.50
Dutch Blue Cottons	5.25/ 5.50
Checks and Blues	4.00/ 4.25
Linsey Garments	2.35/ 2.50
Dark Cottons, European	2.30/ 2.35
Dark Cottons, Egyptian	3.25/ 3.50
Old Shopperies	2.20/ 2.30
New Shopperies	2.25/ 2.30

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$7.25/ $7.50
Domestic Gunny, No. 1	7.25/ 7.50
Heavy Wool Tares	6.50/ 6.75
No. 1 Scrap Baggings	6.00/ 6.25
Roofing Bagging	1.50/ 1.75
Foreign Manila Rope	6.00/ 6.75
Domestic Manila Rope	6.50/ 6.75
Jute Strings	5.00/ 5.25
No. 1 Sisal Strings	5.25/ 5.50
Mixed Strings	1.75/ 2.50

Waste Paper

Base Prices to Mills for Average Packings
F.o.b. New York, Baled

	(Per Ton)
No. 1 Hard White Envelope Cuts	120.00/ 130.00
No. 1 Hd. Wh. Shavings, unruled	110.00/ 120.00
Super Soft White Shavings	110.00/ 115.00
No. 1 Soft White Shavings	90.00/ 100.00
No. 1 Fly Leaf Shavings	45.00/ —
No. 1 Gd'wd Fly Leaf Shavings	35.00/ —
No. 1 Heavy Books & Magazines	19.00/ 21.00
Mixed Books	13.00/ 15.00
No. 1 White Ledger	70.00/ 75.00
Col. Ledger	45.00/ 50.00
Manila Tab. Cards	80.00/ 85.00
New Manila Envelope Cuttings	90.00/ 100.00
Extra Manilas	25.00/ 30.00
Mxd. Kraft, Bag Cuttings	60.00/ 70.00
Kraft Envelope Cutings	80.00/ 90.00
Triple Sorted, No. 1 Brown Soft Kraft	40.00/ 45.00
New Kraft Corrugated Cuttings	40.00/ 45.00
No. 1 Assorted Old Kraft	40.00/ 45.00
New Jute Corrugated Cuttings	18.00/ —
Old Corrugated	14.00/ 15.00
No. 1 News	12.00/ 13.00
No. 1 Mixed Papers	7.00/ 8.00
Box Board Cuttings	7.00/ 8.00
White Blank News	65.00/ 70.00
Overissue News	16.00/ 18.00
Mill Wrappers	14.00/ 16.00
Used Kraft Bags	40.00/ 45.00

Twines

All Prices Nominal, F.o.b. Mill

(Soft Fiber)

Coarse Polished—India	.35¼/ .36½
Fine Polished Fine India	.41¾/ .45
Unpolished—Paper Makers	.32 / .35½
Tube Rope	.33¼/ .35¼
Wrapping	.37 / .39
Cotton	.63¼/ .66¼

(Hard Fiber)

Mex. Sisal	.21 / .27
Manila (Reprocessed)	.30 / .32

(American Hemp)

Polished Hemp	.36¼/ .60
Unpolished	.32¼/ .54

PHILADELPHIA

Domestic Rags (New)

(F.o.b. Eastern Shipping Point)

Shirt Cuttings—	
New White No. 1	.10½/ .11
New White No. 2	nominal
Light Silesias	.07½/ .08
Black Silesias, soft	.06 / .06½
New Unbleached	.10½/ .11¼
Washable Prints	.06½/ .07
Washable No. 1	.05 / .05½
Blue Overall	.07½/ .08
Cottons—According to grade—	
Washable Shredding	.03 / .03½
Fancy Percales	.06¾/ .07¼
New Black Soft	nominal
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.05¾/ .06½
Bleachable Cotton Cuttings	.06½/ .07
Men's Corduroy	.05½/ .06
Ladies' Corduroy	.05 / .05½
Cottonades	.05½/ .06

Domestic Rags (Old)

(F.o.b. Eastern Shipping Point)

White No. 1—Repacked	4.50 / 5.00
Mixed White	4.00 / 4.25
White No. 2—Repacked	3.50 / 3.75
Thirds and Blues—	
Miscellaneous	2.50 / 2.75
Repacked	3.00 / 3.25
Roofing Stock—	nominal
Foreign No. 1	1.65 / 1.70
Domestic No. 1	1.55 / 1.60
Domestic No. 2	1.45 / 1.50
Roofing Bagging	— / 5.75
Old Manila Rope	

(Continued on page 30)

Put your Costs through the wringer—

It costs over ten times as much to evaporate a pound of water as it costs to press it out. Every drop you can squeeze from your sheets of paper or board at the press rolls represents steam and time saved at the driers. Every minute saved at the driers represents additional tonnage at the winders.

Superintendents who know their costs also know that Hamilton Felts play an important part in reducing costs.

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will put your costs through the wringer.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Miami Woolen Mills

Hamilton Felts

Established 1858

PRICES

CONTINUED FROM PAGE 28

Bagging

(F.o.b. Eastern Shipping Point)

Gunny No. 1—	
Foreign	nominal
Domestic	$5.50 / 6.00
No. 1 Clean Bright—	
Sisal Strings	.04½/ .05
No. 2 Clean Bright—	
Sisal Strings	.03½/ .04
Sisal Jute	.02¾/ .03
Scrap—	
No. 1	5.00 / 5.50
No. 2	2.50 / 3.00

Old Papers

F.o.b. Phila. Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00/$115.00
No. 1 Hard White Shavings, unruled	100.00/ —
Soft White Shavings	80.00/ —
White Blank News	65.00/ 70.00
Soft White Shavings, One Cut	/ 80.00
No. 1 White Ledger	65.00/ 70.00
No. 1 Heavy Books & Magazines	20.00/ 22.00
Overissue Magazines	nominal
New Manila Envelope Cuttings	75.00/ —
No. 1 Assorted Old Kraft	35.00/ 40.00
No. 1 Mixed Paper	7.00/ 8.00
Box Board Cuttings	8.00/ 10.00
Kraft Corrugated Cuttings	75.00/ 80.00
Old Corrugated	14.00/ 16.00
Overissue News	13.00/ 15.00
No. 1 News	10.00/ 12.00

BOSTON

Old Papers

F.o.b. Boston, Mill Prices, Baled

No. 1 Hard White Shavings, unruled	$6.25 /$6.75
No. 1 Hard White Shavings, ruled	6.00 / 6.50
Soft White Shavings, Misc.	6.00 / 6.25
No. 1 Fly Leaf Shavings	— / —
No. 2 Fly Leaf Shavings	4.25 / —
No. 1 Grdwd. Fly Leaf Shvgs.	1.75 / 2.00
No. 2 Groundwood Fly Leaf Shavings	1.50 / 1.75
Mixed Colored Shavings	2.00 / 2.25
New Manila Env. Cuts, one cut	4.50 / 4.75
Hard White Envelope Cuts, one cut	7.00 / —
Triple S'ted No. 1 Br. Soft Kraft	3.75 / 4.00
Mixed Kraft Env. & Bag Cuttings	4.00 / 4.25
Kraft Envelope Cuttings	5.00 / 5.50
No. 1 Heavy Books & Magazines	1.75 / —
New Manila Env. Cutt'gs, one cut	2.35 / —
New Manila Envelope Cuttings	4.00 / 4.25
White Tabulating Cards	5.00 / —
Groundwood Tabulating Cards	1.50 / 1.75
White Blank News	2.25 / 2.50
No. 1 Assorted Old Kraft	3.50 / 4.00
No. 1 Mixed Paper	.47½/ —
Overissue News	.90 / 1.00
No. 1 News	.55 / .60
Box Board Cuttings	.60 / .70
New Corrugated Cuttings, Kraft.	2.75 / 3.00
Old Kraft Corrugated Containers	2.00 / 2.25
Old Corrugated Containers	— / 1.10
Jute Corrugated Cuttings	1.07½/ —
Paper Strings	2.00 / 2.25

Bagging

(F.o.b. Boston)

Gunny Bagging—	
Foreign	(nominal)
Domestic	7.00 / —
No. 1 Old Rope	6.25 / —
Mixed Strings	1.50 / —
Transmission Rope—	
Foreign	nominal
Domestic	3.00 / 3.50
Manila Rope—	
Foreign	nominal
Domestic	6.25 / —
Jute Carpet Threads	6.00 / —
Bleachery Burlap	— / 8.00
Scrap Burlap—	
Foreign	6.50 / 6.75
Domestic	6.50 / 6.75
South America	6.50 / 6.75
Wool Tares	
Foreign	7.50 / —
Domestic	7.50 / —
Austr. Wool Pouches	7.50 / —
New Zealand Wool Pouches	5.00 / —
New Burlap Cuttings	7.00 / —
Heavy Baling Bagging	7.00 / 7.50
Paper Mill Bagging	— / 5.00
No. 1 Roofing Bagging	1.75 / —

Domestic Rags (New)

(F.o.b. Boston)

Shirt Cuttings—	
New Light Prints	.07¾/ —
Fancy Percales	.08 / —
New White No. 1	.11 / .11¾
New Light Flannelettes	.08 / .08½
Canton Flannels, Bleached	.10 / .11
Underwear Cutters, Bleached	.11½/ —
Underwear Cutters, Unbleached	.11 / .12
Silesias No. 1	.08 / .08½
New Black Silesias	.04½/ —
Red Cotton Cuttings	.05¾/ —
Blue Overalls	— / .08½
Soft Unbleached	.11 / .12
Blue Cheviots	.08 / .08½
Fancy	.06 / —
Washable	.06 / —
Khaki Cuttings	.06½/ .07½
Corduroy	.04 / —
Men's Corduroy	.04 / —
Khaki Canvas	— / .06
B. V. D. Cuttings	.11½/ —

Domestic Rags (Old)

(F.o.b. Boston)

White No. 1—	
Repacked	5.00 / 5.50
Miscellaneous	4.50 / 5.00
White No. 2—	
Miscellaneous	2.65 / —
Twos and Blues, Repacked	2.75 / —
Old Blue Overalls	4.00 / 4.50
Thirds and Blues, Repacked	2.20 / —
Miscellaneous	1.80 / —
Black Stockings	3.50 / 4.00
Roofing Stock—	
No. 1	1.70 / —
No. 2	1.60 / —
No. 3	1.50 / —
No. 4	1.50 / —
No. 5, Quality A.	1.60 / —
Quality B.	1.50 / —
Quality C.	.95 / —
Old Manila Rope	6.00 / —

Foreign Rags

(F.o.b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F.o.b. Chicago) Mill Prices, Baled

Shavings—	
No. 1 Hard White Envelope cuts, one cut	$120.00/ —
No. 1 Hard White Shavings, unruled	114.00/ —
No. 1 Soft White Shavings	100.00/ —
No. 1 White Ledger	60.00/ 65.00
No. 1 Heavy Books & Magazines	28.00/ 30.00
White Blank News	55.00/ —
Mixed Kraft Env. & Bag Cuttings	80.00/ —
No. 1 Assorted Old Kraft	25.00/ —
Overissue News	20.00/ —
No. 1 News	— / 16.00
No. 1 Mixed Paper	9.00/ —
Old Corrugated	15.00/ —
Mill Wrappers	11.00/ —

MARKETS

Blanc Fixe

Supply good; demand steady. Pulp is currently quoted at $85.00 in bags, car lots at works, 6 cents per pound, l.c.l., deld.; by-product $75.00 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

Bleaching Powder

Supply adequate. Delivery good. Shortage of shipping containers restricts export. Prices range from $4.25 to $4.75 per 100 pound drums, l.c.l. works.

Casein

Demand continues dull. Domestic products reports show 58 percent decrease in 1948's season. Prices firm. Current prices on processed acid precipitated casein at 28½ to 32 cents per pound for domestic grades and 25¾ to 26¼ cents for imported grades, f.o.b. shipping point.

Caustic Soda

Dry types continue short with renewed demands and strike likely to tighten situation. Shortage of tank cars noted. Solid caustic is reported at $3.10 per cwt.; flaked and ground is quoted at $3.50 per cwt. in 400 pound drums, $4 to $4.25 per cwt. in 100 pound drums—car lots at works; liquid 50 percent in tank cars at $2.50 per cwt.; liquid 73 percent in tank cars at $2.60 per cwt.; at works.

China Clay

Demand steady. Supply excellent. Domestic filled clay is $9 to $11.50 per ton, car lots; coating clay is $14 to $22. Imported clay quotation, short tons, $16 to $35, export warehouse.

Chlorine

Supply approximately in balance but likely to tighten as result of strike. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt., in multi-unit tank cars, f.o.b., works.

Rosin

Buying dull. Export inquiry good. Prices rise. Gum rosin in drums per 100 pounds net in car lots, f.o.b. Savannah; B, $6.50; G, H, I, K, $7.37. Wood rosin per 100 pounds net, car lots, f.o.b. Savannah; B, $5.00; FF, $6.50.

Rosin Size

Heavy demand. Supply good. Seventy percent gum and pale wood grades. Tank cars, $6.20 to $6.30, f.o.b. southern shipping point.

Salt Cake

Heavy kraft production keeps demand ahead of supply. Production under contract. Domestic salt cake quoted at $25 to $28.

Soda Ash

Supply-demand near balance. Deliveries up to schedule. Export likely to expand. Current prices, car lots per 100 pounds; in bulk, $1.15; in paper bags, $1.40; and in barrels, $1.90.

Sodium Bicarbonate

Supply good. Demand easier. Reported as $1.95 per cwt. paper bags, carload lots.

Starch, Corn

Supply good. Demand easier. Prices steady. Record crop forecast. Pearl grade quoted at $6.66 per 100 pounds; powdered starch at $6.77 to $6.81 per 100 pounds; car lots, New York.

Starch, Potato

Demand increased. Prices lower. Supply good with heavy crop forecast. High grade quoted at $5.60 cwt. f.o.b. Idaho, $6.25 f.o.b. Aroostook; Pearl grade $6.10 cwt. f.o.b. Aroostook.

Sulphate of Alumina

Demand increased. Supply steady. The commercial grades are quoted at from $1.50 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.50 per 100 pounds in bags, car lots, at works.

Sulphur

Supplies ample. Demand active. Production shows heavy gain. Annual contracts are quoted at $16 to $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf ports is $17.50 to $19.50 per long ton.

Talc

Demand continues far in excess of supply. Prices steady. Domestic grades are currently quoted at $23 per ton in paper sacks, f.o.b. mills; Canadian at $35 and up per ton. All prices in car lots.

Tapioca Flour

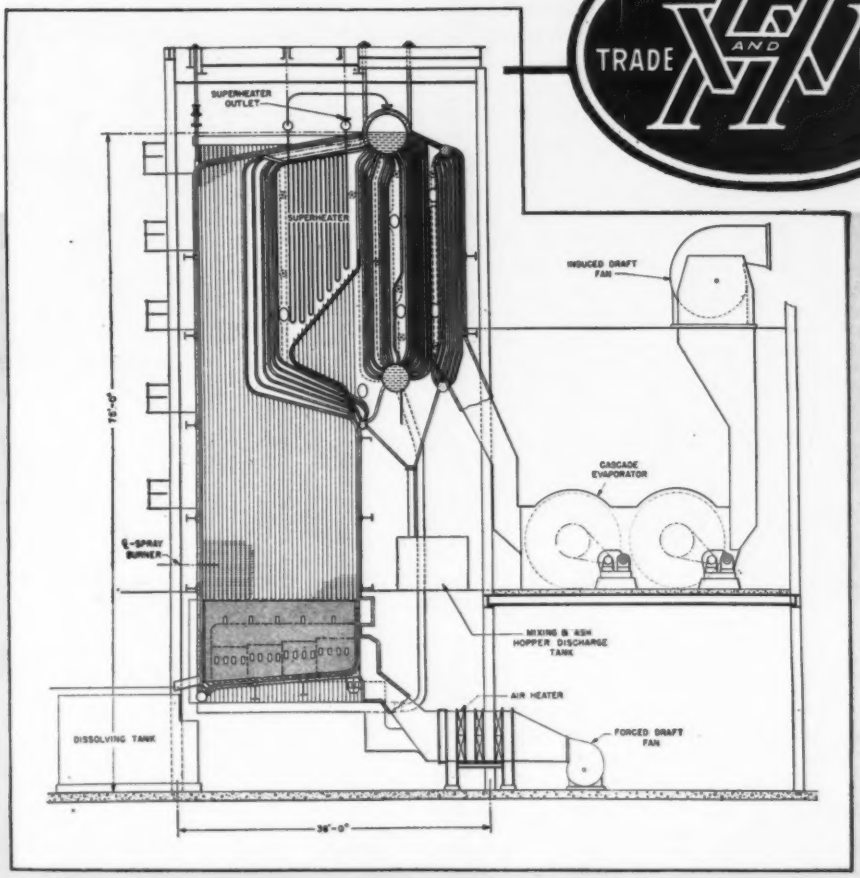
High grades in fair supply and demand. Superior high quoted at $10.25 cwt., high grades $9.25 cwt., in limited supply, low grades adequate. Medium, quoted at $9.25 cwt., on dock Atlantic and Gulf ports.

Titanium Dioxide

Supply of paper grades continues unequal to demand. Shipments on allocation. Anastase 18c pound carload lots, 18½-19c l.c.l., rutile, 20c pound carload lots, 20½-21c l.c.l.; 50-pound bags, f.o.b. plant, minimum freight allowance.

another B&W recovery unit for

TRADE AND MARK



HOLLINGSWORTH & WHITNEY COMPANY has purchased an additional B&W-Tomlinson Recovery Unit for installation at its modern Chickasaw sulphate pulp and paper mill at Mobile, Alabama. Two other B&W units have performed satisfactorily at this mill since 1940. The third unit now on order is of 200-ton capacity and will produce approximately 92,000 lb of steam per hr at 625 psi and 725F at superheater outlet. The contractor is Rust Engineering Company, Pittsburgh.

Repeat orders are an old story with B&W-Tomlinson Recovery Units. High chemical and heat recovery, high availability, low-cost operation and maintenance simplicity account for their industry-wide acceptance.

THE BABCOCK & WILCOX CO.
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N. Y.,
WORKS: ALLIANCE AND BARBERTON, O.; AUGUSTA, GA.

BABCOCK & WILCOX

P-29

FOR PAPER MILLS — B&W-Tomlinson Recovery Units . . . B&W, Integral-Furnace, Stirling, Type H Stirling and Cross-Drum Boilers . . . Boiler Components . . . Pulverizers . . . Fuel Burning Equipment . . . Refractories . . . Process Equipment . . . Alloy Castings . . . Seamless & Welded Tubes for all Pressure and Mechanical Applications.

FINANCIAL RECORD

Preferred Stocks	Per Share Calendar Year 1947	Earnings 12 Mos. to Approx. 6/30/48	Indic. Annual Divid. Rate	Sept. 15 Closing Market Price
Armstrong Cork Co. $3.75 Cum.	$38.64*	$43.53*	$3.75	94
Armstrong Cork Co. $4.00 Cum. Conv.	38.64*	43.53*	4.00	
Celotex Corp. 5% Cum.	24.25c	26.25g	1.00	
Champion Paper & Fibre $4.50 Cum.	65.90f		4.50	
Container Corp. of Amer. 4% Cum.	102.74	88.25	4.00	
Crown Zellerbach $4.20 Cum.	56.40f	55.07g	4.20	99
Crown Zellerbach $4.00 Cum. Conv. 2nd	211.39f	217.70g	4.00	
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	9.16	8.59	2.50	
Flintkote Co. $4 Cum.	81.91	80.04	4.00	101
Robert Gair Co. Inc. 6% Cum.	18.01	16.26	1.20	18
International Paper Co. $4 Cum.	236.51	245.85	4.00	
Johns-Manville $3.50 Cum.	128.81	134.48	3.50	103
Kimberly Clark Corp. 4½% Cum.	70.03	73.34	4.50	
Kimberly Clark Corp. 4% Cum. Conv. 2nd	95.88	100.73	4.00	
MacAndrews & Forbes 6% Cum.	62.20	62.56	6.00	
Mead Corp. 4¼% Cum.	81.56	79.68	4.25	
Mead Corp. 4% Cum. Conv. 2nd	53.34	51.75	2.00	
Paraffine Cos. Inc. 4% Cum. Conv.	152.76a		4.00	101½
Rayonier Inc. $2 Cum.	13.58	15.44	2.00	
St. Regis Paper Co. 4.40% 1st A	76.93	84.43	4.40	88½
Scott Paper Co. $3.40 Cum.	43.95	50.24	3.40	90
U. S. Gypsum Co. 7% Cum.	211.34	362.32	7.00	
United Wallpaper Inc. 4% Cum. Conv.	(d)1.30a		2.00	
West Virginia Pulp & Paper 4½% Cum.	75.75c	78.49g	4.50	
Common Stocks				
APW Products Co.	$1.24	$1.46	$0.25	
American Writing Paper Corp.	1.61	.47	0.25	
Armstrong Cork Co.	6.41	7.17	2.60	51
Celotex Corp.	6.59c	7.15g	2.00	28
Certain-Teed Prods. Corp.	3.75	3.92	0.90	15½
Champion Paper & Fibre	5.57f		2.00	
Congoleum Nairn Co.	4.55	5.12	2.00	34½
Container Corp. of America	10.09	8.50	2.00e	36¼
Crown Zellerbach	6.81f	6.53g	2.00	29¾
Dixie Cup Co.	5.87	5.37	1.00	31
Flintkote Co.	6.27	5.83	2.50	33¼
Robert Gair Co. Inc.	2.83	2.59	0.40	7⅜
Great Northern Paper Co.	4.56	4.44	2.40	
International Paper Co	15.02	15.62	4.50	58
Johns-Manville Corp.	3.17	3.28	1.40	34¼
Kimberly-Clark Corp.	4.29	4.52	1.40	21
MacAndrews & Forbes Co.	3.68	3.70	2.50	
Marathon Corp.	3.39c	3.93g	1.40	22
Mead Corp.	7.33	7.10	2.00	19
National Container Corp.	4.13	3.11	1.20	10¼
Paraffine Cos. Inc.	2.40a		1.20	
Rayonier, Inc.	7.30	8.47	1.00	32⅞
Ruberoid Co.	10.88	12.13	2.75	
St. Regis Paper Co.	2.66	2.87	0.60e	11
Scott Paper Co.	3.02	3.49	2.20	46½
Sutherland Paper Co.	6.87	6.56	2.50	
Taggart Corp.	1.29		0.60	
Union Bag & Paper Corp.	7.93	8.35	3.00	33⅛
United Board & Carton	4.95b		1.25	10⅝
U. S. Gypsum Co.	10.00	12.49	6.00	98
United Wallpaper	(d)0.11a		—	4
West Virginia Pulp & Paper	11.40c	11.56g	3.00	

(a) Year ended 6/30/48
(b) Year ended 5/30/48
(c) Year ended October 31, 1947
(d) Deficit
(e) Plus extras
(f) Year ended 4/30/48
(g) Twelve months to approximately 7/31/48
(*) Pro forma

Dividends Declared

Champion Paper & Fibre Co., and subsidiaries, reported net earnings of $8,540,040 or $7.34 a common share for the year ended April 30. After appropriations of $925,000 for possible losses from revaluation of inventories, $374,623 for possible extraordinary losses from abandonment of property, and $650,000 for increased cost of property replacements, the remaining amount of $6,135,486.86 or $5.75 per common share was transferred to earned surplus. For the quarter ended April 30, net income after appropriations was reported at $1,989,528 or $1.71 a common share. The company's policy of retaining a portion of its funds from net income for reinvestment in productive property was continued during the year. Available funds, supplemented by borrowings, were used to the extent of approximately $9,500,000 for expansion and development, and $1,000,000 for timberland acquisitions. This course of action was said to enhance the security of employes as well as the stockholders equity.

Crown-Zellerbach Corp. announced net profit of $4,288,688 or $1.45 a common share for the quarter ended July 31, contrasted with $4,824,205 and $1.73 for the same period of 1947. Net sales for the quarter were reported at $40,338,423 against $35,838,303 a year ago. Losses incident upon loss of production and material and reconditioning after the Columbia River Basin floods totaled $1,128,000, reducing equity earnings in that amount.

Letters

Dear Mr. Lockwood:

In your September 2 edition on page 20 you briefly commented on our earnings for the first six months of this year. I do not know where you obtained your information, but without a fuller statement relating to reserve provisions the comparison with last year is misleading. The point is earnings for the first six months of last year were more than the same period this year before setting aside reserves. I think this should be corrected and I am enclosing an extract of the report that we prepared for the press.

Editor's note—Extract herewith:

"The Whitaker Paper Co. reported earnings for the first six months after tax provision amounted to $484,687. In the same period 1947 earnings totalled $601,661 from which there was deducted $150,000 to provide a reserve of $100,000 for possible inventory decline and $50,000 as an addition to bad debts reserve leaving a net profit of $451,661. No provision has been made for additional reserves in the first six months' period of this year.

"Earnings for the first six months this year were equal to $4.04 a share of new stock and $3.77 a share last year after providing for the reserves mentioned above."

We appreciate the interest you have shown in our undertakings and with kindest regards, we remain,

H. C. STEWARD
Treasurer
Whitaker Paper Co.
Cincinnati, Ohio

September 3, 1948

Dear Mr. Heitzeberg:

Your periodical is one of those which has been reviewed regularly by the Engineering Index over a period of years.

Your editorial page states that Paper Trade Journal is indexed regularly in Industrial Arts Index and we would like to suggest that the Engineering Index be added to this notation.

Your cooperation in this matter would be greatly appreciated.

CARRIE H. ULLMAN,
Editor
Engineering Index, Inc.
New York, N. Y.

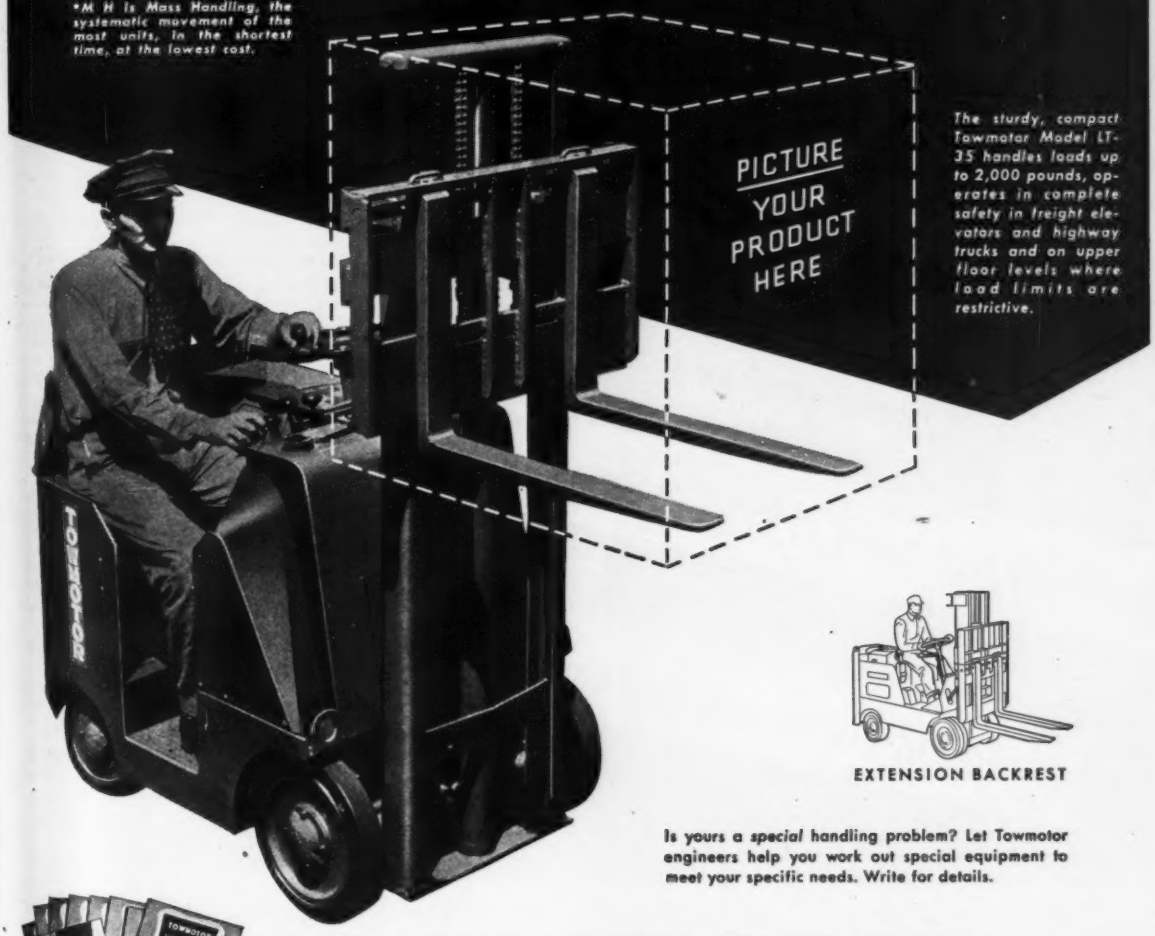
Glad to oblige. See page 5.

Is HANDLING a Help or a Headache?

MODERNIZE WITH TOWMOTOR MH*

*M H Is Mass Handling, the systematic movement of the most units, in the shortest time, at the lowest cost.

Towmotor Mass Handling is a sure cure for handling "headaches." Towmotor Fork Lift Trucks, Tractors and Accessories, gasoline-powered for full-time, full-power service, will increase productive output, provide savings in time, money and space. On every operation, large or small, versatile Towmotor equipment provides all the benefits of modern handling techniques . . . lifting, transporting and stacking materials and products of almost any size, shape or weight . . . helping increase capacity of machines and manpower. And Towmotor Mass Handling is economical, too . . . that's why more *professional handlers*, the men who have to make handling pay a profit, use Towmotor than any other fork lift truck.



The sturdy, compact Towmotor Model LT-35 handles loads up to 2,000 pounds, operates in complete safety in freight elevators and highway trucks and on upper floor levels where load limits are restrictive.

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Is yours a *special* handling problem? Let Towmotor engineers help you work out special equipment to meet your specific needs. Write for details.

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New Towmotor Specification Folder contains complete information on all Towmotor Fork Lift Truck models. Send for free copy.

Plan to attend the 3rd National Materials Handling Exposition, Philadelphia, Jan. 10-14, 1949.

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Mines: Newgulf and Moss Bluff, Texas

B. C. Cellulose Sponge Plant

VANCOUVER, B. C. — Canada Pulp Products, Ltd., has opened its new Granville Island plant here. Product of the new factory will be cellulose sponges, hitherto manufactured only in the United States and Scandinavia.

Employment for 30 full-time workers will be provided at the plant, which utilizes as its prime raw material high grade white pulp, supplied by British Columbia's forest industries.

President of the new concern is Frank Parker, of Qualicum, a pioneer of 26 years in the lumber industry. Former joint owner of C. W. Logging Co., Ltd., and Centre Creek Timber Co., Ltd., he is vice-president of B.C. Truck Loggers' Ass'n.

Vice-president and general manager is Camillo Carlsen, an arrival in recent months from Denmark. A leading member of the Danish underground in World War II, he received personal citations from General Eisenhower and Air Marshal Tedder for aiding Allied military personnel to escape from German hands. Mr. Carlsen was formerly joint owner of a multi-story private parking building, the Automobile-house, in Copenhagen, and a director of Northern Diesel Auto Ltd. of the same city.

The $100,000 local factory, only sponge plant in operation in the Dominion, contains a laboratory in which research on new cellulose products is being conducted.

Collins Litigation Dismissed

NORTH WILBRAHAM, Mass.—E. H. Thomas, new president of the Collins Mfg. Co., paper maker, said on September 10 that the voluntary receivership proceedings in State Superior Court, as well as the petition to the Federal Court seeking involuntary bankruptcy, have been dismissed. All trade creditors, he added, are being paid in full and other creditors made secure.

The mill has been in operation since June 14, Mr. Thompson said, adding that the plant and equipment, all are in excellent condition, having been kept intact, and the entire property is for sale.

New directors and officers have been elected and the intention is to continue the mill in operation until a favorable sale can be made.

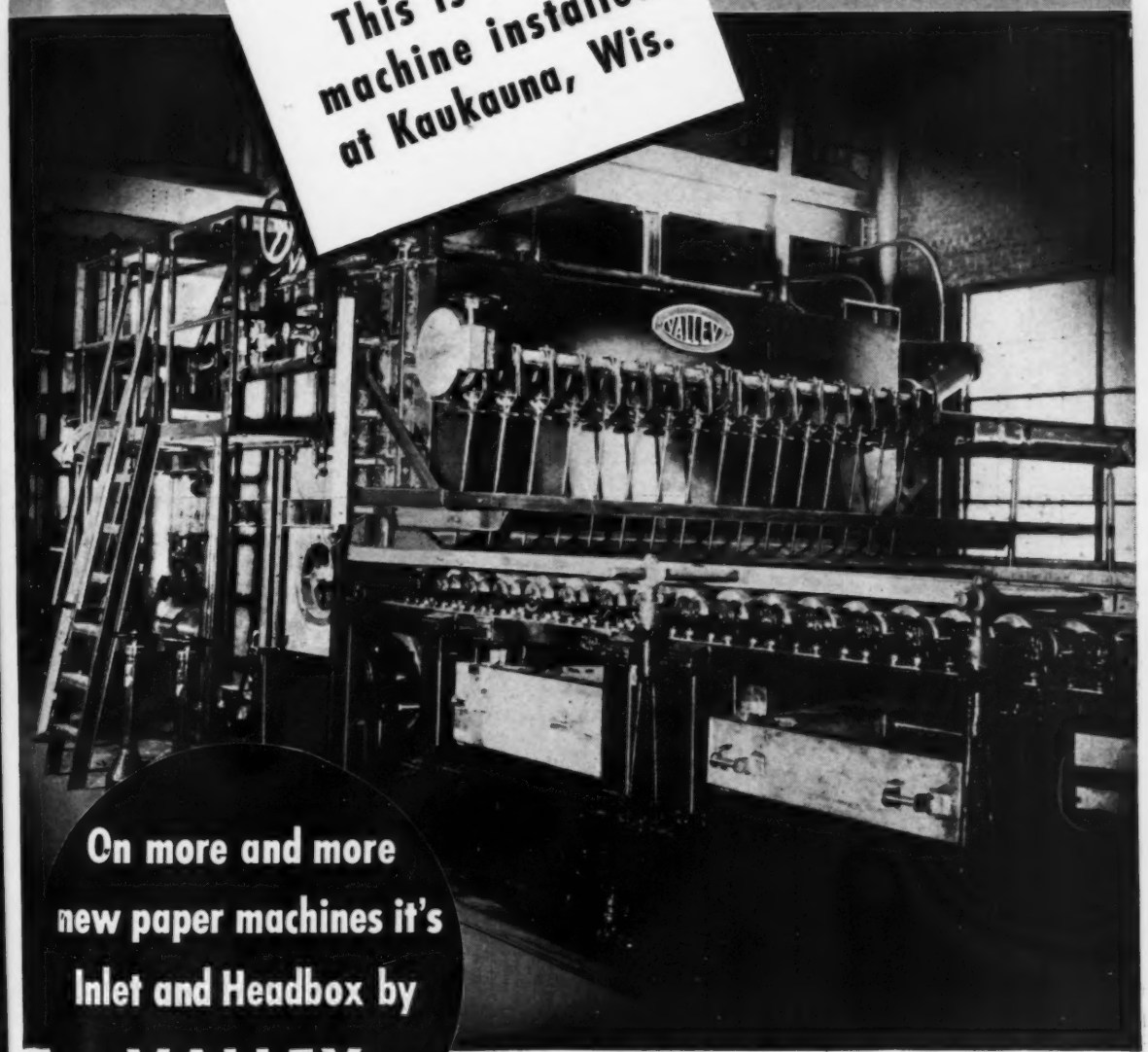
Alkali Allocations Ended

WASHINGTON — There is no longer any need to develop export allocation quotas for the alkali industry, it was agreed at a final meeting on September 10 between representatives of the industry and the Office of Industry Co-operation.

This action was based on the improved supply and demand situation in alkali, it was stated after the meeting. As a further step, the Alkali Industry Advisory Committee agreed to dissolve, after government spokesmen expressed appreciation of its services during the time when the agreement had been under consideration.

Again... IT'S INLET AND HEADBOX BY VALLEY

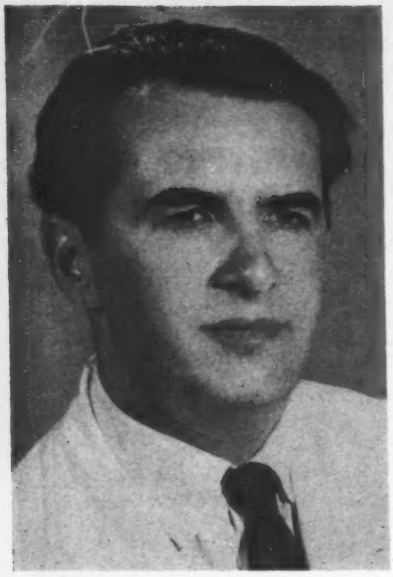
This is a new machine installed at Kaukauna, Wis.



On more and more new paper machines it's Inlet and Headbox by VALLEY

VALLEY IRON WORKS CO.
Appleton, Wisconsin

FORMATION CALIPER LEVEL SHEET INCREASED SPEED HIGHER TEST



DR. M. TARTACOVSKY

—of Cairo, Egypt, who has been the representative in that area for the past ten years for the Crown-Zellerbach Corp., has informed *Paper Trade Journal* that he intends to make a business tour of the United States in the immediate future to establish personal contact with his paper industry friends. . . Dr. Tartacovsky, a member of the Egyptian Ass'n. of Paper Importers, founded the paper import firm in 1930. From 1925 to 1930, he was manager of the export department of Paper Mills Gebr. Schmitz, A. G., of Marken, Germany.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1948		Corresponding Weeks—1947	
July 31	96.5	August 2	103.9
August 7	97.0	August 9	105.1
August 14	96.1	August 16	104.8
August 21	97.7	August 23	103.7
August 28 (Revised)	95.2	August 30	104.1
September 4	**94.8	September 6	84.7

COMPARATIVE MONTHLY SUMMARIES

1947						1948	
Jan.	102.1	May	106.2	Oct.	109.5	Jan.	100.3
Feb.	105.9	June	106.2	Nov.	109.3	Feb.	99.8
Mar.	106.1	July	93.5	Dec.	101.5	Mar.	100.8
Apr.	105.1	Aug.	104.2	Year Avg.	104.3	Apr.	100.8
		Sept.	102.0			May	100.5
						June	‡94.5
						July	‡88.1
						Aug.	‡96.8

‡ Preliminary Ratios.

COMPARATIVE YEARLY SUMMARIES

	1941	1942	1943	1944	1945	1946	1947	1948
Year to Date	94.5	92.6	87.9	87.5	87.7	99.8	103.3	97.4
Year Average	97.4	90.4	87.8	88.1	89.4	101.1	104.3	

** Indicates 1948 volume of 169,676 tons—Comparable week 1947 —134,235 tons.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1948		Corresponding Weeks—1947	
July 31	92	August 2	99
August 7	90	August 9	97
August 14	93	August 16	100
August 21	93	August 23	100
August 28	93	August 30	99
September 4	91	September 6	79

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1947	99	103	101	100	101	101	90	99	96	101	99	89	98
1948	99	100	102	102	100	94	81	92					

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

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Wood Pulp

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It's been our job to incorporate these essentials, pasting, cutting and forming into fast, continuous-action machines. We've spared no cost of research and experimentation that points to a more effective machine at a lower price. Our engineers are constantly on the look-out for ways to increase the variety of bags each machine will produce. As new bag making materials appear we design specialized machines to handle them. We manufacture over 200 types of bag machines to produce the following styles of bags:

Cellophane *and* **Glassine** *bags and tubes for cigars, foods, textile products . . .* **Duplex Bags** *for coffee, sugar, chemicals . . .* **Specialty Bags** *flat and square (gussetted) for millinery, notions, candy . . .* **Sacks** *for flour, sugar, shopping bags.* **Heavy Duty** *multiwall bags for cement, fertilizer, potatoes . . .* **Dry Cleaner** *bags . . .* **Grocery Bags**—*self opening square and square (gussetted) styles.*

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OBITUARY

Carl A. Carlson

Carl A. Carlson, 60, sales engineer for the Norton Co., Worcester, Mass., died on August 29, in a plane crash near Winona, Minn. Born in Stockholm, Mr. Carlson graduated from the Sala Engineering School in Sweden. He came to the United States in 1912 and began his long career with the Norton Co. in 1913, where he started work in the machine shop. He was transferred to France in October 1920 to aid in the organization of the company's branch plant erected in that year near Paris. Returning to Worcester in 1922, Mr. Carlson became affiliated with Norton's machine division until January 1923 when he was appointed to the sales engineering department. He has remained a member of this department ever since.

Frederick L. Reeves

Frederick L. Reeves, 87, president of C. B. Hewitt & Bros., Inc., wholesale paper dealer, New York City, died at his home in Montclair, N. J., on September 9. Mr. Reeves joined the Hewitt firm more than 50 years ago. He was a charter member of the New York Paper Trade Ass'n. Surviving Mr. Reeves is a daughter, Mrs. Inez E. Wall.

Maxmillian F. Woodka

Maxmillian F. Woodka, 70, active in the paper sales business in Toledo for 42 years, died there on September 4.

Mr. Woodka was a salesman for the former Mitchell Paper Co., and Paddock Merchandise Co., and in 1919 he helped organize the United Merchandise Co., a wholesale paper firm, or which he was an executive. It was sold in 1934, and Mr. Woodka became a salesman for the Buckeye Paper Co. He retired eight years ago. Surviving are his widow, Mrs. Catherine Woodka; a daughter, three sisters and a brother.

Emil R. Gasser

Emil R. Gasser, 44, chief physicist of the Farrel-Birmingham Co., Inc., died at his home in Buffalo, N. Y., on September 5. Mr. Gasser was first employed by Farrel-Birmingham in 1928. Mr. Gasser was born and reared in Switzerland and his death occurred only a week after his return from an extended visit to that country. Surviving him are his widow and son living in Buffalo, and his mother and a brother and sister who reside in Switzerland.

John N. Schneider

John N. Schneider, 59, who had served for 33 years as secretary-treasurer and office manager of the Marshall Paper Co., and its successor, the Universal Paper Co., died at his home in Appleton, Wis., on August 24. Mr. Schneider is survived by his widow; six daughters and two sons.

Howard Butt

Howard Butt, 58, vice-president and manager of the New York office of the Wm. Powell Co., died at his home, Side Hill, Morristown, N.J., on August 23. Mr. Butt joined the Powell company, a valve manufacturer of Cincinnati, Ohio, in 1930 and was made a vice-president in 1944.

Thomas A. Farquharson

Thomas A. Farquharson, proprietor of the Atlas Folding Paper Box Co., Hamilton, Ont., died on September 6, at Pointe au Baril, Ont. A native of Scotland, Mr. Farquharson lived in Hamilton for the last 16 years.

Pasquale Aloia

Pasquale (Patsy) Aloia, 65, of Westfield, N. J., retired waste paper dealer, died on September 9 in Rahway Memorial Hospital. Born in Italy, Mr. Aloia came here in 1901. Surviving are two sons and five daughters.

Talc Production Record

WASHINGTON — Record production of 516,094 short tons of domestic talc were reported for 1947 by the Bureau of Mines, U. S. Dept of the Interior, last week. This tonnage was greater than 1946's record by 59,028 short tons. Total dollar value at $14.89 per ton in 1947 was $7,682,481, one and a quarter million dollars greater than 1946's at $14.10 per ton.

INDUSTRIAL DEVELOPMENT

Wood Pulping by the Asplund Defibrator

By Uno Lowgren

Wood chips are pulped in the ASPLUND Defibrator at elevated temperatures in a steam atmosphere corresponding to pressures of between 125 and 175 pounds per square inch. The wood chips are continuously introduced into a high temperature preheating chamber by means of a screw or a reciprocating plunger feed. Heating by saturated steam at temperatures ranging from 350 to 370° F. causes softening of the binding substances, the so-called "middle lamella" between the individual fibers. After passage through the preheating chamber, the heated chips are carried to grinding discs where the fibers are separated. After defibration the pulp is blown from the defibrating chamber through reciprocating or nozzle valves to a collector under atmospheric pressure. The pulp produced, the so-called "ASPLUND fiber," is quite free and consists mostly of undamaged fibers. The steaming and defibration process does not affect the chemical composition of the pulp to any greater extent unless chemical agents are present during the operation. Power consumption is low. Fiber produced is suitable for building boards, such as insulating and hardwood; also for roofing felts as rag substitute and as bulk fiber.

Introduction

The Asplund Process, named after its inventor, Arne Asplund, is principally a mechanical separation of fibers carried out at elevated temperatures of from 350 to 370° F. The material to be pulped is heated by steam, at pressures of from 125 to 175 pounds per square inch, and becomes thoroughly softened. The softening of wood material mainly affects the binding substances between the individual fibers, the so-called "middle lamella." The softening effect of heating of wood has long been known and utilized in various ways in the pulping industry. One example is steaming of logs before they are converted into ground wood pulp in a grinder. Another example is the steaming of chips in a digester for various periods of time and, upon release of the steam and discharge from the digester the subsequent pulping of the steamed chips at atmospheric pressure. The ASPLUND fiber separation process, contrary to these older methods, takes place while the wood is still subjected to the high steam pressure and elevated temperature. The softening of the middle lamella, that takes place at such elevated temperatures as 350 to 370° F., has the same effect as if this substance had actually been melted. The separation of the fibers at these elevated temperatures can, therefore, be made at a relatively low power expenditure and the fibers produced remain mostly undamaged. The separation of the fibers is ordinarily not fully complete and some bundles of unseparated fibers are usually present to varying extents.

For the proper separation of the fibers it is very important to have the wood material—usually in the form of chips—as completely heated as possible before the chips reach the pulping or defibration zone. The wood chips are, therefore, taken through a heating chamber which is under steam pressure of from 125 to 175 pounds per square inch. The time required to heat ordinary wood chips completely to the temperatures of the surrounding steam is from 60 to 90 seconds and is determined by several factors. One is the thickness of the chip—the thicker the piece the longer the time required;

President, American Defibrator, Inc., New York, N. Y.

A paper read at the National Meeting of the Forest Products Research Society, Chicago, Ill., March 22-24, 1948.

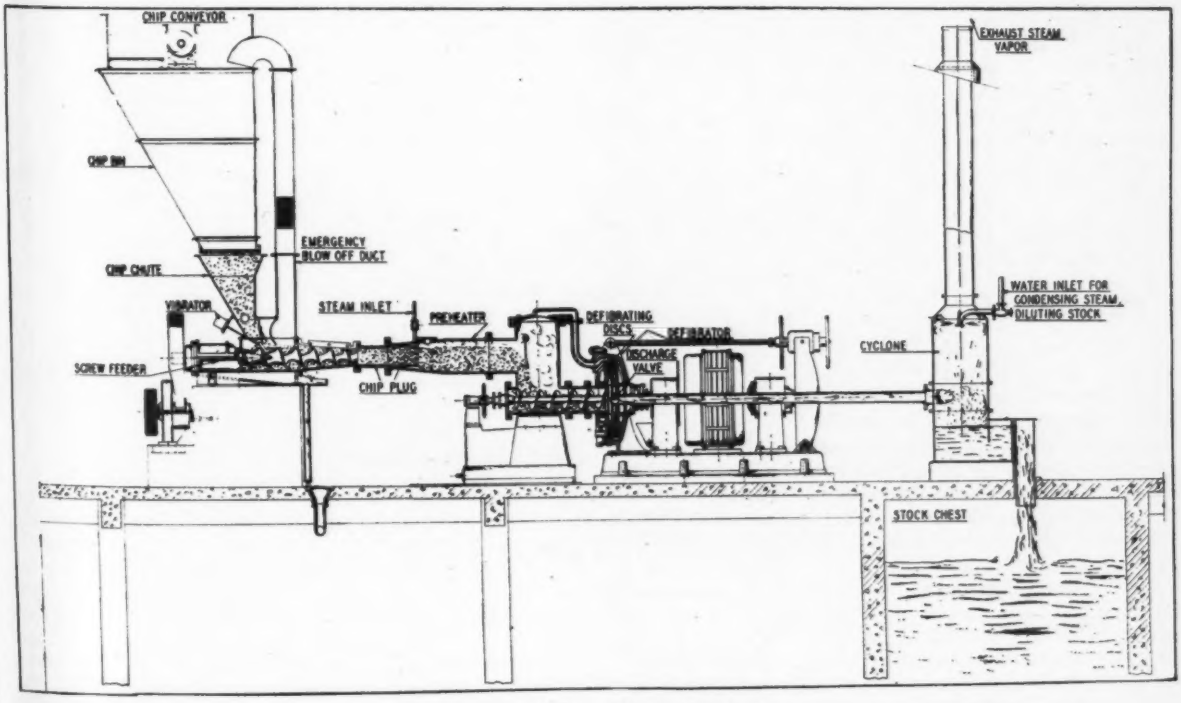


Figure 1.—Flow diagram of Asplund defibrator.

a piece of wood ¼ inch thick will require four times the heating time that is needed for a piece ⅛ inch thick. The moisture content also affects the heating time. It is obvious, therefore, that the chips should be of as uniform size as possible and of the same approximate moisture content, so that they will be uniformly treated during the pulping process.

Operation of the Asplund Defibrator

The ASPLUND Defibrator is illustrated in the flow diagram (Figure 1). The various steps of operation which, combined, constitute the Asplund Process are as follows:

1. Feeding of chips into the preheater
2. Steaming of chips
3. Defibration
4. Discharge of fibre

1. Feeding of Chips

The wood chips are usually supplied to a chip bin located above the feeding end of the machine. This bin ordinarily holds a supply of chips equivalent to from 8 to 16 hours of operation. The chips flow downward into a special hopper equipped with a vibrator, which makes the chips flow down in a steady unbroken stream.

The apparatus that feeds the chips into the preheater is either of the screw type—as shown in the flow design —or of the reciprocating plunger type. The purpose of either of these designs is to compress the chips into a continuously moving plug of sufficient density to seal off the steam in the preheater. The screw feed consists of a conical screw of a compression ratio of about 2.4 to 1, which, incidentally, is approximately the ratio of volume of chips ordinarily packed and its corresponding volume in the original solid wood. The chips are moved forward and kept from revolving by means of splines in the throat surrounding the screw. The chips are delivered and packed into the so-called plug pipe. This pipe is slightly conical-shaped and smooth. Its length varies from 14 to 28 inches, depending upon the type of chips employed—whether fine or coarse and whether of deciduous or coniferous wood. The conical bore will also vary for one type of chips to another.

As most chips are prepared from green wood or wood waste, they will carry with them the natural content of wood moisture or sap. During the heavy compression in the screw feed throat, a substantial amount of free wood moisture will be squeezed out. This moisture is removed through holes drilled in the throat and through the water slots located in the flange of the throat.

2. Steaming of Chips

As the plug of chips emerges from the plug pipe opening in the preheater, the plug expands and falls apart almost instantly. As the preheater is under full steam pressure, ranging from 125 to 175 pounds psi., the heating of the chips starts immediately. As the steam gives up its heat, the condensate is precipitated upon the chips and form additional moisture. Saturated steam is preferred, as highly superheated steam can literally "dry out" the chips and cause burning of the fibers on the grinding discs.

The steaming action of wood is always accompanied by formation and release of acids, such as formic and acetic. The longer the heating, the greater the amount of acids released. It therefore follows that the chips in the preheater become aciduous and the amount of acid present at the elevated temperature employed is sufficient to accelerate hydrolysis of the hemicellulose in the wood. This hydrolysis primarily converts the pentosans into water-soluble pentoses. This effect is more pronounced the longer the heating is carried out. The yield of the pulp produced is, therefore, in direct relation to the steaming time. The steaming time also affects the color of the chips, gradually causing them to darken. This darkening is attributed to the partial transformation of the lignin chain.

Due to the presence of formic and acetic acids, the hydrogen-ion concentration in the wood moisture will vary from 4.5 to 5.5 percent, which requires that the material in the preheater be acid-resistant.

3. Defibration

The fiber separation or the defibration of the steam-heated chips is carried out by grinding discs. These consist of one stationary and one rotary disc, the latter also movable axially and is kept under heavy spring pressure.

The chips are carried to the center of the stationary disc by means of a screw conveyor located below the horizontal preheater. As the chips enter the space between the two discs they fall downward but are immediately caught by the vanes of the grinding discs and thrown out to the periphery. The space between the discs is shaped like a wedge pointed towards the periphery, and the diminishing space between the discs and the rotary force gradually breaks up the chips into fiber bundles. As these fiber bundles reach the grinding zone the fiber separation is completed and the pulp passes through the discs, which at this point are only about .002 inch apart.

Power consumption required for the grinding discs is from 125 to 160 Kwh. per ton of bone dry pulp. The power expended upon the fiber during the separation process is almost entirely transformed into heat. This means that the released heat raises the temperature of the discs themselves as well as the fiber passing through the grinding zone. This temperature increase, in effect, means evaporation of some of the free water carried by the fiber—whether original wood moisture or steam condensate. It is, therefore, obvious that a minimum of moisture must be present during the separation process, to permit the absorption of the released heat. Otherwise the fiber would be overheated and gradually char or carbonize. Such carbonization of fiber occasionally takes place when the wood used is too dry, or if highly superheated steam is used; also if the spring pressure upon the rotating disc is kept too high. It is, therefore, a standard rule that the moisture content of the chips should not be below 30 percent, in order to prevent burning of the fiber or carbonization during the grinding operation. If chips of a moisture content below 30 percent are to be used, it is practical either to wet the chips before they are introduced into the Defibrator or to add extra water by pumping it into the horizontal preheater.

4. Discharge of Fiber

The ASPLUND pulp released from the defibrating zone is collected in the housing covering the grinding discs. This housing is also under full steam pressure. The pulp is released from this chamber to the open air through discharge valves. The valves usually employed are of the reciprocating type, consisting of two valves with a discharge chamber located between them. These valves open and close alternately, like a lock system. Another type of valve consists of a small orifice, the size of which can be regulated by a handwheel. The

size of this orifice is regulated to permit all the fiber to be released while still keeping the quantity of steam released to a minimum. Due to the extremely high velocity of the expanding steam, this type of discharge valve requires careful design and the use of highly wear-resistent material.

The released pulp is usually collected in a cyclone, where the steam is condensed by a water shower and the pulp made into a stock suspension.

Properties of Asplund Pulp

The Asplund fiber as discharged from the Defibrator is a very free pulp and usually contains about 50 percent moisture. If dried in this form, it is quite resilient.

The color of the fiber is slightly darker than the color of the original wood. If the natural content of bark is mixed with the wood chips, the fiber will be considerably darker in color than that prepared from bark-free chips.

The yield of the Asplund fiber varies from 85 to 95 percent. The yield depends upon various factors, such as the steaming time and wood species. Ordinarily wood chips contain from three to five percent water solubles. The steaming process of 1½ minutes in the Defibrator will add another three to five percent to these water solubles. The losses occur as the pulp is brought into stock suspension. If the pulp, therefore, is dried immediately after its release from the Defibrator, the water solubles remain in the fiber and the yield is considerably higher than if the pulp is washed.

Under the microscope the Asplund fiber appears mostly unbroken and undamaged. Its chemical composition is almost identical with that of the original wood, although the hemicellulose content of the fiber is slightly less, due to the losses caused by the hydrolysis. Certain changes in the fiber structure seem, however, to have taken place during the steaming and defibrating process. These changes become apparent when the Asplund fiber is subjected to further chemical treatment. If Asplund fiber is subjected to sulphite cooking, the resultant pulp will not possess the strength and other properties contained in pulp which has been produced from the original wood. Alkaline cooking, however, gives better results, but even here, for instance, the strength of kraft pulp prepared from Asplund pulp in the conventional manner, does not come up to the strength of regular kraft pulp. Exactly what takes place in the fiber structure to cause this lessening of strength during the preheating and defibrating process, has not been established, but it is apparent that some definite changes occur.

Further processing of Asplund pulp and its various applications involve beating and refining, and sometimes screening. For insulating board, a high degree of refining is important to develop the necessary binding properties. For hardwood, a slight refining is usually beneficial to board strength. This also applies to the use of the pulp in roofing and flooring felt manufacture.

The above description refers to the Asplund pulping process as it is carried out in most commercial installations for non-chemical pulping. Several modifications of the process have been developed to meet specific requirements as to capacity of the feeding apparatus, length of heating time in the preheater, size of the grinding elements, as well as the use of various chemically-reactive agents added to the wood. All these variations, however, regardless of their relative importance, do not constitute any basic change from the original Asplund process, but are, rather, modifications that are inherent in the process itself.

Chemical treatment of the raw material in the Asplund process was recognized in the early stages by Asplund himself. The principle of the Asplund process adapted for semi-chemical or chemical pulping includes the steps of soaking the chips with a chemical solution, removal of excess liquor, aging—i.e., allowing the chemical solution to penetrate the chips completely at atmospheric pressure—and the feeding of the chips so prepared into the Asplund Defibrator. The subsequent heating of the wood chips in the Defibrator is accompanied by a delignification the extent of which is determined by the amount and nature of chemicals employed, steaming temperature and length of heating. The pulps so produced are suitable for various paper-making purposes, such as corrugating board, chip-board, and the like.

The Tree Farm's Place in the Texas Forestry Program*

By Nort Baser

"Texas Tree Farm, Tree Farms System." Such is the wording on signs scattered throughout the pinywoods belt of East Texas.

Since the records show that these signs represent 138 tree farms and a total of 2,403,881 acres—one fourth of our commercial timberland—it is important that we all know the nature and scope of the program for which they stand.

In Texas the tree farms system is guided by the Texas Forest Service in cooperation with the Texas Forestry Association and the East Texas Chamber of Commerce. Purpose of the program is to perpetuate the state's supply of timber by encouraging good forestry practices on industry and farm-owned woodlands. The project was initiated in 1944.

Eighteen other states in the nation are conducting similar programs. It might be noted that Texas is second only to Arkansas in acreage committed to the tree farms cause, while only four other states can boast a greater number of tree farms. Texas further claims both the largest and smallest tree farms in the nation.

Through this Texas tree farms system it is the goal to increase the value of the tree "crop" to Texas, both to the owners of the small and large woodland areas, and to protect the forests of the state so they will be a perpetual source of income to their owners and to the many thousands of Texans who derive employment from the forest industries.

Too many Texas farm woodlands, usually on soil not

* Reprinted from "Texas Forest News," May-June, 1948.

Tree Farms in Texas Counties

good enough for field crops, are loafing today. They provide some fire wood and fence posts, but they return little cash to the owner.

Yet our bonafide Texas tree farmers have proven that the farm woods need not loaf. They will go to work for the owner, if the owner goes to work for them. Such owners know it isn't good business to let half of their farms be idle when that land can be a money-maker.

In our new age of fast developing forest management, we have come to regard our forest lands, not as areas from which we take products which can't be returned to the land again—but as tree farms which produce not one, but many continuing crops of trees if handled properly.

Let us examine what is involved in proper handling of forest lands.

First consideration of the owner must be to take steps to protect his property from forest fires. If his land is within the area receiving extensive protection by the Texas Forest Service, he can operate in any way possible with the fire control program already in force. Where such protection is not available, he will have to do his best by being more vigilant and perhaps arranging a reciprocal volunteer program with his neighbors.

The landowner must also follow approved forest practices—such as wise cutting and thinning to insure reproduction—with the view of assuring continuous production of commercial timber crops.

Re-planting of idle acres with forest tree seedlings is often recognized as an integral part of proper handling.

Participation in the tree farms program can go hand in hand with the growing of field crops and livestock grazing. Tree farming doesn't have to be a full time job to be successful. It has its advantages, too. For instance, mature trees, unlike cotton or corn, don't have to be harvested at any particular season of the year. The owner can often profitably delay his tree harvest for a number of years if the market or price offered isn't to his liking.

The tree farm system in Texas includes not only the small owners, but those with forest holdings of an investment and industrial nature. While 92 of the 138 farms registered fall in the small owner category, 32 are of the investment type and 14 are owned by forest industries.

A breakdown of the 2,403,881 acres in accepted tree farms shows 1.32 percent in farm ownership, 31.2 percent in investment area and more than 67 percent industrially owned.

The accompanying map shows the distribution of tree farms and acreage totals by counties. In presenting the picture in this manner, 204 tree farm symbols (instead of the actual number of 138 tree farms) were necessary because of the fact that some of the investment and industrial cooperators have holdings in a number of counties.

At present there are tree farms scattered over 31 East Texas counties. Angelina county has the greatest number with 38, 27 of these being small farm owners. Nacogdoches with 20, Trinity with 18 and Harrison counties with 15 are also high on the list.

On an acreage basis, Jasper, with only six tree farms, boasts the greatest total with 276,744 acres, mostly of an investment nature. Hardin county is close behind with 273,495 acres in its four tree farms, while Newton county has 257,992 acres in seven tree farms.

There are many more owners who could qualify under this program, but they haven't come forth, and authorities haven't had an opportunity to seek them out.

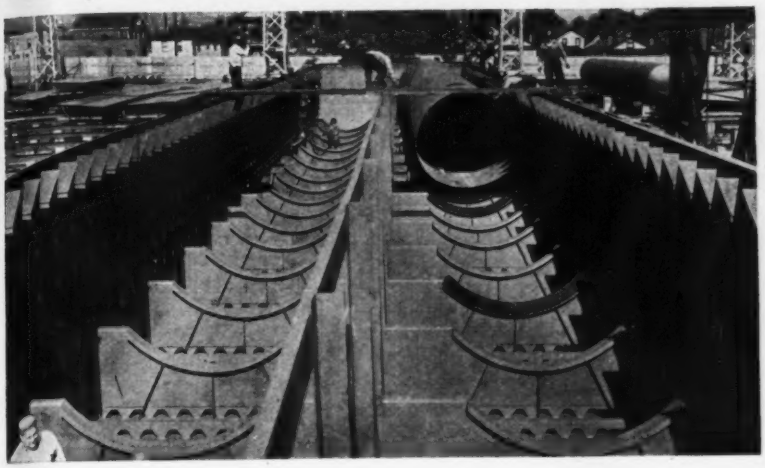
True, woodland owners can do a splendid job without going to the formality of being officially identified with the tree farms program. But such a sign is a sign of good citizenship and sound forest management which plays an important part in setting a good example for others who haven't learned the value of their woodlands. Good forestry practices pay, and we should do everything in our power to let our fellow citizens know it!

LITERATURE

Schutte & Koerting Co., 12th & Thompson streets, Philadelphia 22, Pa. Bulletin, "SK Heat Exchanges and Vapor Condensers." Provides 12 pages of text, photographs and sectional drawings. Also cross-sectional drawings which show methods of operation, and dimension drawings and tables which give overall sizes of various types of heat exchangers and vapor condensers.

Yale & Towne Mfg. Co., 4530 Tacony street, Philadelphia 24, Pa. Manual, "Load King Scales . . . Poised for Accuracy." Contains six new technical bulletins of data, diagrams, selection advice and practical application information about dial scales. One bulletin is devoted to counting scales, two to bench and portable platform scales, others to dormant-platform and crane types, and the last to the special characteristics of weigh-can installations.

EQUIPMENT AND SUPPLIES



Sulphuric Acid Transport

A welded steel barge for transporting sulphuric acid permits an increase in marine deliveries to plants in the chemical industries.

The barge has a watertight, steel deck, beneath which are two cylindrical steel tanks running parallel the length of the hold. Each tank is 8½ feet OD and 135 feet long. Combined capacity is about 865 short tons of acid. The tanks are strapped in cradles formed of 2-inch thick treated hardwood blocks on steel supports, and during voyage are sealed under pressure. Entrance to the hold is through two watertight hatches, one at each end of the deck.

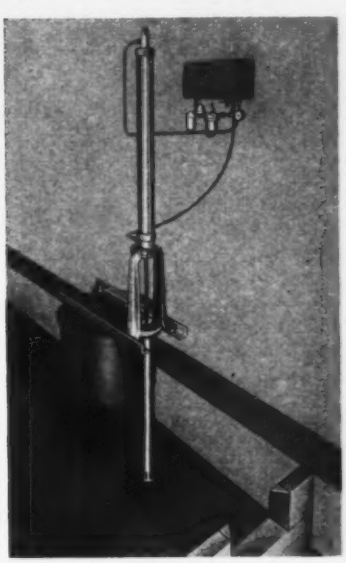
Dimensions of the barge are given as 30 feet wide by 10 feet 8 inches deep. Side decks were designed 3½ feet wide to provide ample space for crews handling mooring lines and cargo loading and discharging lines. The hull is shaped for minimum towing resistance, and has well-rounded corners to minimize damage to other craft or wharves in the event of a collision. Similar barges for transporting liquid chlorine have been built previously by the firm making these sulphuric acid barges. For details and prices write to Dravo Corp., Neville Island, Pittsburgh 25, Pa.

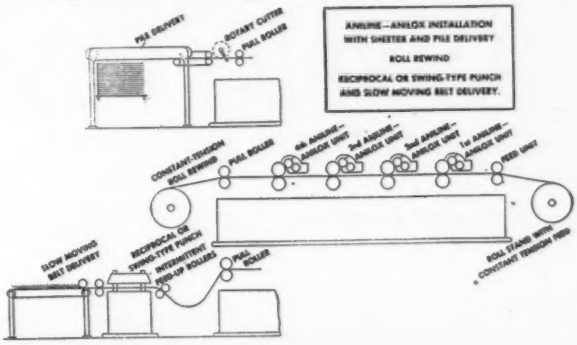
Non-Clog Sewage Pump

This redesigned small non-clog sewage pump is primarily adapted to the pumping of miscellaneous pulps, sewage or trash. Announced improvements include: shaft and bearings increased in size using a two-row heavy-duty ballbearing with matched angular contact thrust bearings; radial and thrust bearings enclosed in sub-assembly cartridge for easy, quick replacement of rotating element; removal of rotor does not expose bearings to dirt nor lose adjustment of bearings; for protection against moisture and corrosive gas all bearings are grease lubricated; six rings of packing with lantern for external seal connection are provided on stuffing box; sturdy labyrinth flinger is positive, with large bearing surface provided to eliminate leakage between shaft and flinger; simple external adjustment is planned to take up wear at impeller inlet. For details and prices write to Economy Pumps, Inc., Hamilton, Ohio.

Sampler And Flow-Meter

The Automatic Sampler and Flow-Meter is designed to withdraw samples of liquid flowing over a weir and to provide complete information on volume and character of weir effluent. Equipment consists of stainless steel tube to be submerged in liquid at specified distance upstream of weir; air cylinder which raises and lowers a plunger inside of tube to deliver samples into container; electric timer and valve to control air cylinder so that sampling is at predetermined intervals. Plunger is so shaped that any change in rate of flow over weir automatically adjusts the volume of each sample in direct proportion to the change in flow rate, according to standard weir formulae. Units placed at proper locations will provide valuable information on both volume and content of flow from individual machines, processes and the final sewer losses from an entire plant. For details and prices write DeZurik Shower Co., Sartell, Minn.





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SECTION OF THE

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Physiological Effects of Sulphate Pulp Mill Wastes on Shellfish*

By Walter A. Chipman, Jr.[1]

Abstract

The addition of sulphate pulp-mill wastes to sea water reduced the hours that oysters remained open and decreased the rate of pumping of water through the gills. The depression of the rate of filtration was found to be proportional to the concentration of effluent.

Strong kraft soap, weak soap, and black liquor were found to contain this physiologically active material in great amount. It tends to concentrate in the soap portion of the mill products. Oxidation of the weak black liquor makes the material ineffective.

The toxic substance can be precipitated from mill liquors by salt. Its presence in the soap is due to adsorption by the latter of material "salted out" of the black liquor by the treatment with salt.

The toxic action of sulphate pulp-mill wastes on aquatic animals has been observed and reported many times. These wastes, when present in sufficient concentration, were found to be injurious to fishes as early as 1908 by Ahlin *(1)*. Other European workers, such as Ebeling *(2, 3, 4)*, Vallin *(5)*, Hagman *(6)*, Järnefelt *(7)*, Bergström and Cederquist *(8)*, Vestergren *(9)*, and Erdtman *(10)* have pointed out the toxicity to fresh-water fish of the resin acids present in the sulphate mill effluents. In the United States toxicity studies have been reported for fresh-water fishes by Cole *(11)*, Cole and Warwick *(12)*, Extrom and Farner *(13)*, and others. No work prior to that reported in this paper has been done on the effect of sulphate mill wastes on shellfish. The experimental studies of the physiological action of these pollutants on oysters was carried on in connection with an investigation of a marked decline in the oyster production of the York River, Virginia, which resulted from a failure of the oysters to grow and develop a good quality for market. The complete report of this investigation recently has been published *(14)*.

Although the emphasis on abatement of pollution is rightfully placed on conditions affecting fresh-water streams, more and more attention is being directed to studies of pollution of coastal waters since the number of industrial plants along the coast is being increased. It is in the brackish waters of bays and estuaries that many of the seafoods are produced and pollution of such areas is of importance. This is particularly true of shellfish.

The oyster, being sedentary, is unable to avoid unfavorable environments excepting by closing its shell and remaining closed. If this condition persists for some time, the animal must perish. Any material of the surrounding water that causes the oyster to remain closed will prove injurious. Other substances not causing this response may still damage the organism through interference with its inner mechanisms concerned with feeding and respiration.

Undisturbed on the bottom, the oyster relaxes the adductor muscle and allows the shells to open from the elasticity of the hinge. Sea water is drawn through the gills by the action of multitudes of cilia, microscopic hair-like processes which completely cover the gills. The water is forced through small pores into the water tubes within the gills. Here the oyster blood is oxygenated by close contact with the water within the tubes. This water then passes to a chamber above the gills and is forced out of the shells in a rather rapidly moving stream. As particles of microscopic plants and animals are brought to the gills with the water, they are collected on the gill surface and become embedded in a slime which covers the soft parts of the animal, and, by the action of the minute cilia, are carried across the surface of the gill to and into the mouth. The contractions of the adductor muscle and the mantle, a covering of the body of the animal lining the shell, control the flow of water by regulating the opening and closing of the mantle chamber to provide for a greater or lesser access of the outside water to the gills. Disruption of the pattern of ciliary motion also will stop the flow.

The experimental work herein reported consisted of observations of the effect of pulp-mill effluent on the time oysters remained open, on the pumping activity of the gills of oysters, and on the rate of water filtration of the entire oyster. A few studies were made of the physiological action of kraft soaps and black liquor. Bioassays

TABLE I.—MEAN VALUES OF HOURS OPEN IN VARIOUS CONCENTRATIONS OF PULP-MILL EFFLUENT

Concentration in Parts per 10 Liters	Mean Value of Hours Open	Standard Deviation	Standard Error
1,000	5	...	...
100	8.5	...	...
50	12.8	2.40	± 0.85
25	13.7	2.52	± 0.89
10	13.5	3.89	± 1.17
5	17.9	1.29	± 0.65
2.5	20.5	3.15	± 1.57
2.0	19.2	1.63	± 0.67
1.0	20.9	2.06	± 1.03
0	21.3	1.29	± 0.26

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26, 1948.

[1] Aquatic Biologist, U. S. Fish and Wildlife Service, College Park, Md.

were completed on various fractions of these materials in attempts to isolate the physiologically active substance.

The effluent samples tested, collected from the sewer of the mill at different times, were composites of like unit volumes taken every 15 minutes for a period of 5 hours. Since the waste flowing in the sewer was quite varied in character even these composites showed considerable differences in their specific gravity and in their components. For this reason the dilution used with one particular effluent may not truly correspond in strength with a similar dilution of another, and variations in physiological effectiveness may be expected. Similar difficulty in obtaining effluent samples of comparable composition were reported by Extrom and Farner *(13)*.

Effect of Pulp-Mill Effluent on Time That Oysters Remain Open

The laboratory experiments of the effect of pulp-mill effluent on the time that oysters remain open were conducted on oysters placed in chambers receiving running sea water or sea water to which known amounts of sulphate mill effluent were being added. By means of a light thread connecting one of the shells of the oyster with one end of a pivoted lever, a tracing of the movement of the shell was obtained on a smoked paper fastened to a revolving kymograph drum. The experiments were carried on for periods from 6 to 30 days using concentrations of effluent in sea water from 1:10 to 1:10,000. Shell movement records were obtained for 49 oysters treated with the effluent and compared with those of 25 oysters in sea water during the same time.

The results varied in the experiments performed with different samples of effluent. However, the number of hours that the oyster remained open was reduced when effluent was present in the sea water in concentrations stronger than 1:10,000. The time the oysters remained open decreased as the concentration was increased. This relationship is clearly seen in Table I which shows the mean values of hours open in various concentrations of the effluent with their standard deviation and standard errors.

A marked physiological response was shown in the type of muscular activity of the oysters subjected to concentrations of effluent 1:1,000 or stronger. Rapid and frequent shell closures gave evidence of an irritating effect immediately after the material was added. These periods of activity were followed by long periods when the oysters remained tightly closed. In very strong concentrations the ability to hold the shells closed was lost. Attempts by the oysters to close their shells after this became less frequent and the strength of the adductor muscle diminished. Long periods when the shells remained open, with only feeble attempts to close at infrequent intervals, were characteristic of the time just preceding death of the oysters.

Effect of Effluent on Rate of Water Movement by Action of Gill Mechanisms

Tests were made of the effect of various concentrations of effluent on the rate of water filtration by the activity of the gill mechanisms. After prying the shells slightly apart, a glass rod was inserted to prevent the oyster from closing. A small rubber tube was inserted into the chamber from which the water leaves the oyster and the remaining space on the excurrent side was packed with wet cotton. Water entering the oyster on the incurrent side would then leave the oyster through the rubber tube, which in turn was connected to a calibrated glass tube. By adding a small amount of carmine suspension to the water flowing in this tube, it was possible to time between marks the passage of the tip of the red cone thus formed. In other tests the tube was connected to a small chamber from which the incoming water would drop onto an electric drop-counter and the number of drops per minute recorded. These methods have been fully described by Galtsoff *(15, 16)*. Such arrangements would rule out the activity of the shell and mantle in controlling the rate of flow and limit it to that of the gill epithelium.

In a number of experiments the oysters were subjected to increasing concentrations of the pulp-mill effluent in sea water. In other tests the oysters were kept in one concentration of effluent for several hours. Readings generally were made after half hour exposure to each concentration or at half hour intervals in a fixed concentration of pollutant.

The material physiologically active in altering the rate of flow was present in varying amounts in the different samples. In certain ones concentrations of 1:2,000 and 1:4,000 were effective. In others, the only changes were those brought about by exposure to strengths of 1:100 or 1:2000. The reduction of the rate of water filtration resulting from one of the samples is shown in Table II. The percentage of depression in the rate of pumping of water through the action of the gill epithelium was inversely proportional to the concentration of the effluent.

It was observed also that the effects were temporary and that the rate of pumping returned to its original value once the pollutant was removed. There were no irreparable changes in the gill epithelium after several hours of exposure to the concentrations used in the experiments. It can be inferred that there was no cumulative effect on the ciliary mechanism under conditions of the tests.

TABLE II.—DEPRESSION OF THE RATE OF FILTRATION CAUSED BY PULP-MILL EFFLUENT (SAMPLE 24)

[Specific gravity 1.0043. Carmine-cone method. Figures express means of percentages of normal rate. Each oyster was exposed to one concentration of the effluent for 1½ hours. Three sets of readings weres made at half-hour intervals.]

Concentration, parts per liter	Number of Oysters	Percentage of Normal Rate	Standard Deviation	Percentage of Depression
0	21	100	.....	0
0.25	6	99.2	4.37 ± 0.87	0.8
0.5	18	89.2	8.21 ± 1.90	10.8
1.0	27	77.8	5.83 ± 1.12	22.2
2.0	15	36.5	5.65 ± 1.46	63.5

Effect of Pulp-Mill Effluents on Rate of Pumping of Water by Intact Oysters

Measurements were made of the amount of water pumped by oysters exposed to pulp-mill effluent and to pure sea water under the combined action of all the mechanisms which control the rate of water filtration; namely, that of the ciliated epithelium of the gills and their ostia, the mantle, and the adductor muscle.

The so-called Rubber Apron method was used which involves the technique developed by Nelson *(17)*. In this the oyster is so wrapped in a piece of rubber dam that a cone is formed leading from the excurrent side. All the water entering the oyster must leave through this cone. By mounting the oysters in a constant level tank the flow of the water from the oyster is collected in a chamber which discharges when filled to a certain level, the volume at which it empties being known. A record is maintained automatically of the shell movement and the amount of water pumped by the oyster.

The amount filtered by individual oysters varies considerably according to size. For this reason a basic rate of pumping was determined for each experimental oyster from records of its activity in plain sea water. The rate of pumping during exposure to various concentrations of effluent was then measured and compared to this basic rate. For each the mean rate was determined, counting only the hours when the shell was open. The fact that

the shells are open does not necessarily mean the oyster is feeding, for many observations had shown that the oysters could remain open and still not pump water.

The results (Table III) show that concentrations of mill effluent of 1:200 and 1:400 gave immediate and marked effects, depressing the water output to a small fraction of its rate observed before treatment. In concentrations of 1:770 and 1:1,000 the effects were less pronounced. Some oysters appeared unaffected and others showed a marked drop in the rate of flow.

For a picture of the combined effects we may consider an analysis of the data of one test, whch was typical of the others, and is shown in Table IV. Both the rate of pumping when open and the hours open were reduced. As a result the total daily amount of water filtered was decreased by the action of the effluent in the sea water with a total for the 12½ days of 760.3 liters for the test oyster and 2259.5 liters pumped by the control, a difference of approximately 1,500 liters.

Effects of Mill Products on Pumping of Water by Gills of Oysters

Physiological tests were made of the various mill products which were found in varying amount and at different times in the effluents. These tests measured the effectiveness of a 30-minute exposure time on reducing the filtering activity of the oyster gills. It was found that strong kraft soap in dilutions of 1:200,000 was very effective. Weak soap and black liquor also caused immediate and marked reduction in relatively dilute concentrations.

Storage of effluent samples open to the air only slightly reduced their effectiveness. Drying of a sample of effluent reduced its ability to alter the rate of water pumping by the gills of oysters, but did not completely destroy it. Ashing of the dried residue caused a complete loss of physiological activity of the material under the conditions of the experiment. A sample of black liquor stored under hydrogen for a period of 14 months was found to retain its potency. Other samples similarly stored only slightly lost their effectiveness in reducing the rate of water filtration of oysters under the experimental conditions.

One sample of black liquor was placed in a flask and the air above displaced with pure oxygen. The flask and its contents, connected to a reservoir containing a known volume of oxygen, was shaken for 90 hours. It was found that the black liquor thus oxidized had lost its ability to reduce the rate of pumping of water by the oysters.

Samples of weak black liquor and kraft soaps were

TABLE III.—EFFECTS OF PULP-MILL EFFLUENT ON RATE OF PUMPING OF OYSTERS (RUBBER-APRON METHOD)

[Rate of pumping of test oysters is expressed in percentage of basic rate determined from records obtained during the number of days these oysters were kept in sea water before pollutant was added. Basic rate for control has been determined for the same periods of time.]

Concentration	Sample No.	Effluent Specific Gravity at 17.5° C.	Oyster No.	Days in Sea Water	Days in Effluent	Rate of Pumping in Per Cent of Original Rate	
						Control	Test
1:200	3	1.0013	1	3	6	119.1	4.4
1:200	3	1.0013	3	3	8	107.5	9.4
1:400	6	1.0012	9	3	1	97.5	46.4
1:400	6	1.0012	8	3	4	93.9	25.6
1:770	6	1.0012	12	3	5	105.1	16.2
1:770	6	1.0012	11	2	6	92.4	84.2
1:1,000	5	1.0013	3	2	4	99.5	114.6
1:1,000	5	1.0013	2	1	6	111.6	125.7
1:1,000	6	1.0012	10	6	5	125.1	102.5
1:1,000	24	1.0043	204	4	1	128.2	22.1
1:1,000	24	1.0043	205	2	2	110.4	70.7
1:1,000	50	1.0022	102	2	3	156.0	39.9
1:1,000	51	1.0014	104	2	13	161.6	46.6

From these tests it can be seen that it is possible to render the active material of the effluent physiologically inactive by oxidation but that it is not readily oxidized.

TABLE IV.—EFFECT OF PULP-MILL EFFLUENT (SAMPLE 51) DILUTED 1:1000 ON THE RATE OF PUMPING PER HOUR AND THE TOTAL AMOUNT OF WATER FILTERED BY THE OYSTERS DURING EACH DAY

[Difference between control and experimental = 1,499.2 liters.]

Day of Observation	Experimental			Control		
	Time Open, hr.	Rate of Pumping, l./hr.	Total Water Filtered, l.	Time Open, hr.	Rate of Pumping, l./hr.	Total Water Filtered, l.
1	24.0	7.4	177.6	24.0	4.8	115.2
2*	*12.0	*9.8	*235.2	*11.1	*6.0	*133.2
2**	**6.1	**2.2	**26.8	**11.2	**6.0	**134.4
3	11.1	1.4	15.5	21.2	7.9	167.5
4	16.8	1.6	26.9	21.6	10.1	218.2
5	14.5	3.1	45.0	21.9	9.9	216.8
6	16.2	2.1	34.0	20.2	10.4	210.1
7	16.4	3.1	50.8	20.9	8.1	169.3
8	15.9	2.8	44.5	16.1	6.2	99.8
9	12.9	3.7	47.7	15.8	7.3	115.3
10	16.2	4.1	66.4	22.1	7.7	170.2
11	16.0	7.0	112.0	23.2	8.2	190.2
12	14.3	6.7	95.8	21.2	9.4	199.3
13	15.8	6.9	109.0	21.0	8.7	182.7
14	12.1	7.4	99.3	23.2	10.9	252.9
Total for 12½ days of test	...	...	760.3	...	...	2,259.5

* Observations made 12 hours before addition of test material to experimental chambers.

** Observations made 12 hours after adding of test material to experimental chambers.

treated in various ways in attempts to isolate in some particular fraction the material responsible for the physiological activity. This involved salt precipitation in the presence of ether and extraction with ethanol and methanol. Bioassays were made of the materials obtained at various stages in the scheme of fractionation. These consisted of examination of the rate of water filtration of oysters exposed to increasing concentrations of the material under observation using the carmine cone technique.

It was demonstrated that the toxic material affecting oysters tends to concentrate in the soap portion of the mill products. This is in agreement with the conclusions of a number of European investigators who ascribe the toxicity to fishes as due to the resin acids and their sodium and calcium salts.

The experimental studies showed that the toxic material could be separated from the soap and from weak black liquor by fractionation. Treatment of mill liquors with salt caused a "salting out" of the effective substance but repeated treatment of the weak black liquor was necessary to accomplish this completely. The sulphate soaps precipitated from the mill liquor by the action of the salt in the presence of ether did not contain the toxic material but the ether extracts were effective.

The evidence indicates that these soaps, when precipitated from the mill liquors, adsorb the toxic substance of these liquors and that this effective material is a constituent of the unsaponifiable portion.

The exact nature of the toxic material was not determined in the work reported in this paper. Erdtman has definitely shown that the toxic substance obtained from the European pine, *Pinus sylvestris*, is a dioxystilbene present in the heartwood of the tree.

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Effects of Stuff Preparation on Formation in Rag Papers*

By F. S. Klein[1]

Abstract

Uniform formation is a prime characteristic of rag papers. A definite balance between length and freeness appears necessary so as to maintain physical strength with clear formation. Present production trends are affecting the type of equipment used in reducing fiber length and will doubtless result in a different distribution of work done on the fibre. Control methods are still quite loose and evaluation methods vary from mill to mill. Since stuff preparation is so vital a factor in formation, it is obvious that there is much work to be done in working out methods of evaluating the "work done" on the fiber along the processing line.

In general, it can be said that rag papers are expected to be stronger, more permanent, and better appearing than other grades of paper. These three main attributes are usually lumped together in the vague phrase "superior quality", which the experienced consumer applies to rag papers in general. To the practical papermaker, rag papers have a distinctive "look" and "feel." For strength indications he relies on the bursting strength test and tearing by hand, and formation is his basis of judging appearance.

In the field of physical strength increased rag content of paper has automatically inferred increased burst, fold, tensile, tear and other tests. The first two are the most commonly used in specifications even though they do not cover the entire strength problem.

The attribute of permanence has always been taken for granted in rag papers. Its technical definitions are virtually unknown to many paper consumers, and as applied in practice cover a much narrower field than paper users refer to when they use the term.

The matter of appearance is of paramount importance since when the consumer mentions "quality" his first thought is for visual aspects. Rag papers have always been considered superior as far as formation, watermark, and general cleanliness are concerned. These papers, in their higher grades, are in fact, sorted and classified on basis of appearance, not only considering cleanliness but in many cases rather fine degrees of formation. In many types of rag papers finish is a decided factor and it is obvious that certain types of finishes require definite formation characteristics since uniformity of finish is dictated largely by uniformity of formation.

In considering stock characteristics required in controlling the formation of regular "mill run" rag papers, the two factors of length and freeness and their relationship to each other appear to be the variables of paramount importance.

Stock Preparation

In general, bond papers will tend to be shorter and slower and as basis weight increases, fiber length will increase, and the stock will tend to be freer. There is obviously a "length-freeness-basis weight" relationship which must be controlled if satisfactory results are to be obtained.

It would appear from this that the stuff preparation problems in relation to ultimate formation are those of achieving a satisfactory fiber length without upsetting the "water drainage" or "freeness" characteristics beyond the point where it can be controlled on the wire.

Because of extra length and what may be called "hardness", for lack of a better term, cotton rag fiber offers a few more stuff preparation problems than wood fiber. The general nature of the raw material, and additional processing steps under the rag papermaker's control also present a few different approaches to the preparation problem.

In the matter of materials, the rag papermaker can, to some extent, select grades of rags which he feels from his experience tend to be "free" or "slow" or "hard" or "soft". Within limitations, he can also vary his cooking methods. In addition to this he is, in general, working in small batches so that he can help overcome variations by "blending" in the furnish.

The process step of "washing" besides its cleaning function also can be regarded as a preliminary beating in which the weave of the fabric is broken down and the job of fiber length reduction is begun.

Since the tackle used is basically the same as that of a beater, it is obvious that the beginning of the length-freeness relationship lies in this step. Unfortunately, the washing process has been largely neglected from this viewpoint and in the past, most attention has been devoted to cleanliness and bleaching rather than to length reduction. Recently, however, the washer problem has been forced to the foreground by production demands and the function of length reduction at this early stage is becoming more important.

Because of its additional length and "hardness", it is taken for granted that rag stock will require longer and more drastic treatment in the beaters. If it is assumed that a representative furnish blend is provided, the problem is basically to reduce the length and keep the freeness "in line". A primary control at this phase is density and it is assumed that light beater will "come", i.e., shorten, more quickly without hydrating. Lighter weight papers are usually loaded heavier and beaten a longer time. Roll manipulation is usually a matter of personal judgment. The general practice is probably to reduce length first and then "brush" for increased slowness if necessary at the end of the cycle. Some engineers, however, feel the opposite technique is desirable, especially when "slow" stock is desired, and the roll is lowered gradually, on the theory that optimum slowness or hydration will be developed by the time length is reduced to the desired stage. The preference for one method or the other is no doubt dictated by the type of paper to be made, the earlier rag preparation steps and the type of tackle in use.

It is in cases where slowness develops too fast in proportion to length reduction that probably the most trouble arises although the reverse can be equally trouble-

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some. These general rules of "thumb" have been upset somewhat in the recent introduction of multiplate beaters which tend to reduce the time factor and probably upset the relation of length reduction to "slowness development."

Jordaning in rag mills has until recently been a "finishing off" process. Since the beater engineer in most cases runs both jordan and beaters by manipulation of the plug setting and perhaps in some few cases by density manipulations, and "backing up" the stock, he reduces the length and increases the slowness to what he feels is the optimum balance.

Perhaps the most common stuff preparation set-up is ordinary Hollander equipment with a jordan between chests all under the control of the beater engineer. In some cases, auxiliary jordans are used to provide varying treatment or to modify stock variations. A less common practice is to jordan directly to the machine and give the machine tender control of jordan manipulation. This latter set-up appears more satisfactory from the point of view of more rapid and complete control of formation.

The present trend toward time reduction is naturally having an effect upon beater and jordan tackle and the distribution of "work" done on the fiber by the different pieces of equipment.

In most rag mills, stuff preparation control is neither very rigid nor distinct. Virtually all types of freeness testers are used and, in some cases, stock is beaten to a given freeness before dropping. Length is probably "measured" mostly by "feel", since most rag mills do not have the help or time available for more accurate measurements by microscope or fractionation. "Panning" stock or making a dilute suspension and examining it visually is another common method of evaluating length and "clearness".

Most of these measurements are in the hands of engineers or supervisors and, other than freeness, tests are relative visual comparisons rather than numerical evaluations by mechanical methods. What "Technical Control Methods" are in use at present are not yet standardized and usually are hinged to some particular local problem. There is no doubt, however, that most rag mills are now concerned with the time factor involved in length reduction, and from this problem more methods on length evaluation of rug fiber will necessarily evolve. Present methods are probably limited to microscopic examination, tear tests, and the grid method developed by de Montigny and Zborowski *(1)*.

Since the length-freeness relationship is controlled in stuff preparation, it would appear that probably 75% of ideal formation lies in this area of processing. The machine tender, with only wire and water manipulations at his disposal is quite limited in his control and if length and water draining are out of balance, he can provide only external manipulations operating in narrow limits to try to overcome these defects.

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Gloss Recorder with Automatic Standardization*

By Richard S. Hunter[1]

Abstract

A 75° gloss exposure head has been designed for gloss measurements. In the laboratory this head may be used with a slide-wire measuring device. This same exposure head may be used in the mill to give continuous records of gloss. It is operated in conjunction with a specially modified recorder of the type widely used in many process measurement and control problems. To obtain continuous accurate measurements of gloss, a method of automatic standardization using a fixed beam of light as standard was devised.

Gloss is known by those who make and use book papers to be one of the factors correlating with printing quality. Surface contour and affinity for ink also correlate with printing quality. The present article describes the development of apparatus for continuously recording the gloss of book papers.

Carpenter *(1)* and the Institute of Paper Chemistry *(2)* have shown 75° specular gloss to be a factor correlating with the printability of book papers. It was for this reason that a photoelectric exposure head having the 75° geometry was built by the writer as one of a series of instruments intended for useful laboratory measurements of the optical properties of materials. Figure 1 is the diagram of a 60° gloss exposure head combined with a new laboratory measuring unit. The 75° gloss head is identical to the 60° head except that the angle between the axis of each beam and perpendicular is 75°, and there is no diffuse-correction photocell facing the sample.

It will be noted that all photocells are in the exposure head wherein they receive light from one lamp thus minor fluctuations in light output do not disturb balance of the instrument. The comparison photocell is brightly and constantly lighted through a heat-absorbing glass. The current generated by this photocell is taken to the measuring unit where it passes through a calibrated resistance decade and slide wire as is shown in Fig. 1. Between the sliding contacts of the decade and slide wire there is thus a variable potential. This variable potential is combined with a high resistance to supply a small current that is varied to balance that from the test photocell mounted in the white-lined diffusing chamber (D). The fact that the resistance overcome by the variable potential is high causes this balancing current to be proportional to the combined reading of decade and slide wire to within one or two tenths of one percent.

Potential across the test photocell is zero at time of balance; because of this, test current is essentially a linear function of light reaching the test photocell. Therefore the combined resistance of decade and slide wire between contacts is proportional to gloss or reflectance within a fraction of one percent. The decade reads in steps of 10, from 0 to 90; the slide wire is variable from 0 to 11. Values of gloss and reflectance are thus read

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[1] Henry A. Gardner Laboratory, Inc., Bethesda, Md.

directly in tens and units, and readily estimated to tenths of units.

Continuous Recording of Optical Properties

Modern industry makes wide-spread use of sensitive continuous recorders to measure temperature, rate of flow, pH, and many other factors. Many of these recorders have electrical detectors of roughly the sensitivity of the galvanometer used with the manual apparatus just described. These recorders are further like the manual apparatus in that a null or continuous-balance method of measurement is used and this measurement is made on a slide wire connected in a circuit, so that its position of contact corresponds to the quantity being measured. In the recorder, a motor fed by the electrical detector drives the slide-wire contact to the position of balance, whereas contacts are adjusted manually in response to galvanometer deflections in the laboratory apparatus.

Usually there is a potential-balancing Wheatastone-bridge arrangement in these recorders so that the quantity actually measured is a small impressed potential such as one obtains from a thermocouple. This potential-balancing circuit is not satisfactory for measurements with barrier-layer photocells because of the non-linear and rather uncertain manner in which photocell potential varies with incident light. A current-balancing circuit is preferred.

It is possible to modify at least one type of continuous recorder and build a current-balancing circuit into it. From the stock-model recorders, the electronic amplifier, the motor-driven slide wire, the pen and chart are used. The additional necessary elements of a current-balancing circuit are added. The result is a sensitive continuous recorder that will record gloss or any other optical property of materials for which a connecting exposure head may be devised.

Continuous Gloss Recorders with Automatic Standardization

The above-described combination of recorder and gloss exposure head has one serious drawback when an attempt is made to use it to measure gloss continuously on a machine in the mill; the photocells used in the exposure head are not perfectly constant in their response to light, but vary in output with temperature. In the laboratory, this draw-back is met by having the instrument operator make settings upon a standard of known gloss and adjust his balancing rheostat with sufficient frequency to insure that the response of the instrument remains accurate. It is hardly practical, however, to expect the operator of a supercalender to read a standard and adjust his instrument every fifteen minutes to assure that it remains in calibration. A method of keeping the recording glossmeter continuously in accurate calibration is necessary.

Some of the electronic-type continuous recorders are equipped with an automatic device for standardizing the potential-measuring circuit at regular intervals. This standardizing device consists of a switch, adjusting rheostat with clutch for engaging it to a balancing motor and standard cell that are connected at regular intervals to bring about adjustment of the reference potential of the instrument.

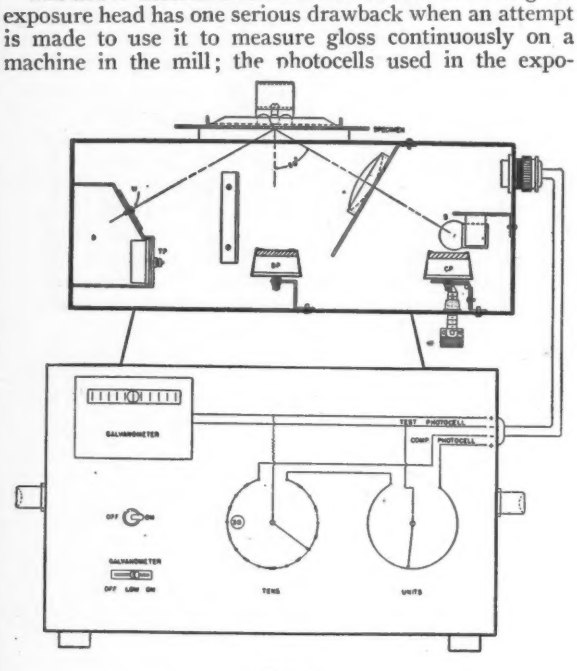

FIG. 1

Diagram showing 60° glossmeter mounted on photometric unit (S—light source, L—lens, W—receptor window, D—diffusing inclosure, TP—test photocell, CP—comparison photocell, DP—photocell for diffuse correction).

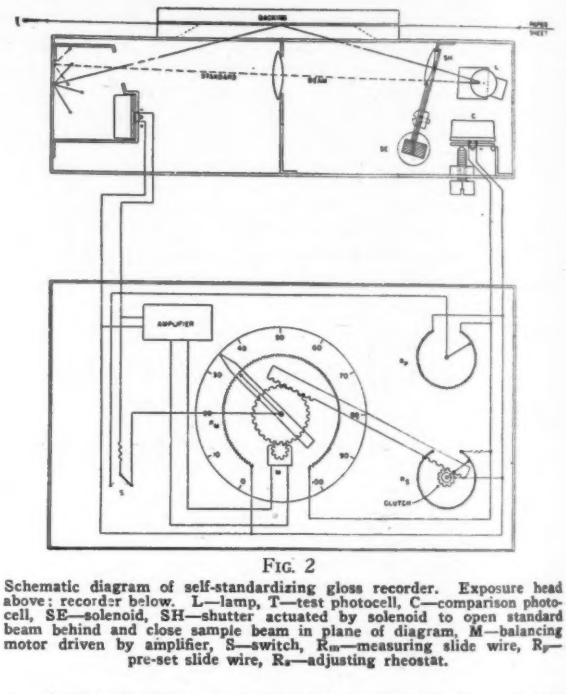

FIG. 2

Schematic diagram of self-standardizing gloss recorder. Exposure head above; recorder below. L—lamp, T—test photocell, C—comparison photocell, SE—solenoid, SH—shutter actuated by solenoid to open standard beam behind and close sample beam in plane of diagram, M—balancing motor driven by amplifier, S—switch, R_m—measuring slide wire, R_p—pre-set slide wire, R_s—adjusting rheostat.

It is possible to use this automatic switch and rheostat in conjunction with a standard beam of light in the exposure head to provide a means for keeping the new recording glossmeter continuously in calibration. Figure 2 is a diagram of this self-standardizing apparatus.

At regular intervals the switch S is operated and simultaneously the rheostat R_s is attached by means of a clutch to the balancing motor, M. The switch, in addition to changing the contact shown, actuates the selenoid and shutter SH in the exposure head thereby closing the beam of light to the specimen and opening the fixed standard beam of light from the lamp directly to the measuring photocell. As shown, the switch disconnects a test-photocell wire from the moving contact of the measuring slide wire R_m and attaches it instead to the central contact of a parallel slide wire, R_p. The two slide wires, R_m and R_p, have roughly the same resistances. On the second slide wire, R_p, the central contact is permanently set to register the amount of light in the standard beam relative to that received from the test specimen when this specimen has a gloss value of 100.

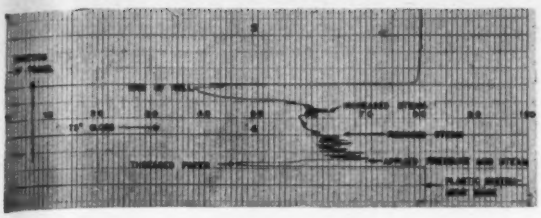

FIG. 3

Demonstration installation of Recording Glossmeter on Super-calender Stack. Arrows point to exposure unit and recorder.

During standardization, the clutch-engaged rheostat, R_4 is driven by the balancing motor until the instrument comes to balance. In other words, this clutch-operated rheostat is adjusted at regular intervals to keep the current in the measuring slide wire at its proper relative value.

In operation, the final reference is always made to a material standard of gloss rather than the standardizing beam. At intervals of about once a week, a gloss standard is installed in the instrument and the adjusting screw mounted behind the comparison photocell is turned until the meter scale shows the correct value of gloss for this standard. Then, the solenoid in the exposure head is operated by means of a manual switch and the proper value for the standard beam in terms of the material standard is obtained. (This value of the standard beam may change slightly from accumulation of dust on optical elements in the exposure head.) This value of the standard beam is then set on the standardizing potentiometer, R_p.

While checking the operation of the instrument, it is desirable to see that the adjusting rheostat is not near either end of its range of travel. If it is too near one end, more or less current can be obtained from the comparison photocell by movement of the adjusting screw. Any such adjustment throws the instrument out of calibration but it can immediately be returned to correct calibration by actuating the standardizing mechanism.

While there have been no actual installations of this apparatus to date, a successful demonstration installation has been made on a supercalender stack. This installation is shown in Fig. 3, and Fig. 4 shows the curve for one roll of paper obtained from this demonstration installation.

The curve starts with a high value of about 80 because the back of the plastic guide behind the paper had this high gloss value. When the paper was threaded through the stack, the gloss reading then dropped to 46. It promptly rose to almost 70 when the roll was started and pressure and steam were applied. As the roll of paper ran through the machine, the gloss fluctuated considerably from one moment to the next, but on the average it tended to drop rather gradually. At one point about midway in the roll the amount of steam was reduced, and both the gloss value and fluctuation in gloss dropped correspondingly. Later, when the gloss reading dropped to about 58, the amount of steam was increased and gloss then increased and showed greater fluctuation. When pressure was removed at the end of the roll, gloss again dropped, this time to below 40. The paper was taken from the stack and the gloss reading then returned to that of the plastic guide.

In closing it may be pointed out that the technique

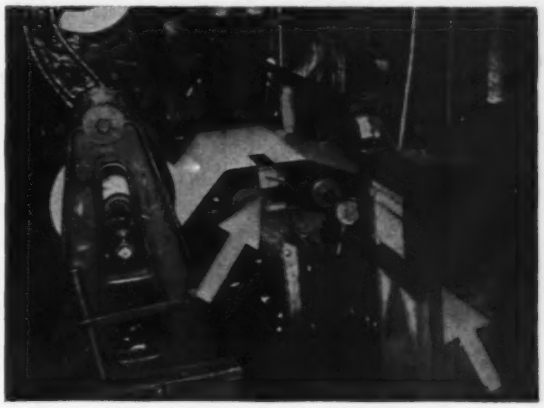

FIG. 4

Gloss record (strip chart) of one roll of paper from super-calender.

here applied to gloss measurements may be applied with little variation to measurements of brightness, opacity and to at least some of the factors of color. Because paper and paper products are handled so extensively as sheets passing through continuous machines, it is felt that these new techniques may be of special interest to the paper industry.

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The Uses and Abuses of Fiberboard in Modern Construction*

By Griffith S. Clark[1]

Abstract

With the increase in the usage of fiberboard for construction purposes it becomes the responsibility of the manufacturer to provide the customer with adequate information so that the product is used to its greatest advantage.

The right type of material should be sold for each particular application and instructions should be given as to the method of use. The user should be cautioned to use adequate stud spacing, to compensate for expan-

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[1] Homasote Co., Trenton, N. J.

sion caused by moisture, to apply a proper plaster base if the board is to be plastered, and to use proper nailing techniques. Suggestions are given.

The evolution of the home, from the original tepee of poles covered with animal skins to the present palace of comfort has been very interesting, slow, and tedious.

Early during the evolution, rocks were arranged and coated with mud. Strange to relate, the process of applying mud, even though in a somewhat refined form, has hung on through the ages, and today there is still the mud finish even in the most expensive homes.

The first successful material to challenge the superiority of mud for the interior finish was probably paper, used in various forms which was sometimes applied as a heavy paper directly to the wall, or in conjunction with cloth. This latter procedure is still used on certain types of construction in those parts of this country where climate permits. However, it is not very satisfactory and certain refinements have been necessary.

The gradual development from paper to the present fiberboard is a story within itself. The results are evident. There was an economic need for a material. There was an architectural demand for a material with pleasing appearance and greater structural strength than plaster would contribute. The reduction in weight with superior strength was a tremendous step forward. The basic principal of using fiberboards in place of plaster has been accepted by the buying public, and in most instances by the building code authorities. Its use has extended beyond interior applications and is the accepted material for exterior sheathing, insulation, and sound absorption.

The responsibilities to the manufacturer have therefore been increased with these new uses, and it would be wise to stop here and consider what happens to the product when it is sold—and how the customer can be assured his full value in purchasing the material.

Use Recommendations

The first condition which is subject to criticism is that the material is improperly sold. A great many products do not stand successive wettings satisfactorily. Many contractors request a board by its trade name, for performance, or because they are more familiar with that name, which they feel applies to all fiberboards. Just as a customer will walk into an electrical appliance house which may sell only G. E. equipment knows he is buying a G. E., even though he thinks of all refrigerators as "Frigidaire," With this thought in mind, many dealers supply what product they have on hand, and make no inquiry as to how it will be used. If it is an exterior sheathing job, which may be out in the weather for weeks, the damage may be done there. The cure is self-evident—insist upon the sales department giving the correct information concerning the physical properties to the dealer. That is a sales problem. The responsibility in this instance is to carry in mind the various conditions which may be adverse that the product is liable to encounter, and continue to develop products which will meet these conditions satisfactorily.

Second, fiberboard is inadequately applied. Too many jobs fail because the stud spacing is too great for the material used and buckling or warping results. The cure, complete instructions on stud spacing, size and kind of nails, and greater tensile strength to overcome unusual conditions.

Third, expansion. When the fiberboard is taken from its original package, or fresh from the dealer's stock, it is usually in a dry condition. However, when it becomes a stabilized part of the structure, it may contain 14% or more moisture. This increase in moisture content usually means a larger dimension to each piece of fiberboard in place, then it had in its original condition and the result is weaving or buckling in the surface. The cure, proper instruction on spacing each piece during application, or better yet, the development of materials with less affinity for moisture.

Fourth, when used as a plaster base, fiberboards should be covered with a scratch coat of approximately ⅜-inch thickness, then a 24-hour drying period, and a brown coat of the same thickness and another 24-hour drying period, before the white coat is applied, if the instructions of the Federal Bureau of Standards are to be observed. Today it is almost impossible to get this. The plasterers apply the scratch and brown coats in one application and follow with the white coat as soon as possible. When this is done, it is not unusual to inspect the finished job and observe the outlines of each lath, which is definitely *not* good business..

Fifth, surface. Too little has been done regarding the dissemination of the proper knowledge obtained through research as to how the nailing should be done, how the nail holes should be filled, and if paint or texture is to be applied, the kinds of materials used and proper application of same. Probably all have seen fiberboard jobs which outlined each nail, with its telltale brown spot, and cracking around the filling agent which definitely marred the surface and gave the further impression of a cheap job. Every manufacturer of any fiberboard suffers under these conditions. The cause is simple. Nails on outside walls or on uninsulated ceilings readily absorb heat and become cold. The inside room temperature being around 70°F., with a high relative humidity present, causes a condensation at this cold spot and a likely place for dust to accumulate. Over a complete season, sufficient dust has been deposited to outline this location. The cure is sinking the nailhead within the board, using a type of nail with a sharp edge on the head which cuts the fiber and does not dimple the surface. When the filler is applied, use a type which will stand manipulation in a stiff fashion, and coat over the top of the opening, leaving an air space between the filler and the nailhead to insulate the surface against this condition. Many fiberboard jobs are unsatisfactory today because the wrong nails were used in application, and the material is literally falling off the nails.

Development Recommendations

In regard to the future market for fiberboard certain corrective measures would make the product more useful.

1. Increase the size of the sheets until an 8 by 16 feet size can be supplied. This will eliminate more than 20 joints in each 1000 square feet which in turn will mean a great saving in cost of application and a more pleasing appearance to the customer.
2. Increase the tensile strength so that these sheets can be handled without breakage.
3. Increase the nail holding capacity so that they can be properly applied, and will remain in place.
4. Increase the compressability enough to permit the product to be used in off-site fabrication and withstand transportation without damage.
5. Increase the surface density to withstand average handling without damage, but smooth enough to be used as a paper or paint base without having to use plaster or plastic textures.

There is ample business for the present manufacturers at the present time. However, if they wish to be a major factor in the building industry years from now, the field problems must be considered and the improvements made.